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GOVERNMENT-AS-A-PLATFORM: ENABLING PARTICIPATION IN A GOVERNMENT SERVICE INNOVATION ECOSYSTEM

Master's Thesis
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Abstract

Platforms are revolutionizing every dimension of our economy, society and lives. They are changing boundaries, tasks and power structures of existing industry ecosystems as well as the nature of competition in different markets. The core driver for this transformation is that platforms provide potential for a new kind of value creation by allowing organizations to create entire ecosystems that leverage the expertise of a diverse pool of external complementors, resulting in an unprecedented scope of innovation. As a result, it has been suggested that government-as-a-platform, which is simply defined as a government service innovation ecosystem, could be a revolutionary solution for improving public service delivery.

The most critical determinant of any platform's success is its ability to attract participants to join and contribute to it, since on its own a platform cannot create value. The objective of this study was to discover how a government service innovation ecosystem, government-as-a-platform, should be designed so that different groups of actors, such as public and private sector organizations, would want to contribute to it, and generate innovative solutions for delivering public services in an improved way.

The empirical part of this study was conducted as an embedded single case study focusing on the healthcare industry. Research data was collected through semi-structured thematic interviews with Finnish public and private sector actors representing different sides of the platform. Data analysis was performed as an iterative process, which included transcription, categorization and coding, and eventually synthesis of the data. Furthermore, the research findings were compared with existing literature to improve the validity and conceptual level of the findings.

The research findings demonstrate that a platform that is open, flexible, transparent and accessible attracts participation. More specifically, convenience in terms of quick, easy and agile processes, as well as information about the platform is critical for platform contribution. In terms of participant motivations, company recognition, learning, knowledge sharing and contribution to the greater good were discovered to drive platform participation. In addition, the research findings revealed that factors related to benefits provided by the platform, such as market access and operational efficiencies, encourage platform participation. Finally, it was noted that a supporting infrastructure, which consists of processes, organizational structures, regulation, leadership and a common vision should be in place to facilitate the existence of platforms.

Keywords platform, platform ecosystem, digitalization, innovation, public services, government

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Tiivistelmä

Digitaaliset alustat mullistavat yhteiskuntamme ja elämämme kaikkia ulottuvuuksia. Ne muuttavat olemassa olevien toimialaekosysteemien rajoja, tehtäviä ja valtarakenteita sekä kilpailun luonnetta eri markkinoilla. Murroksen suurimpana taustatekijänä on alustojen tarjoama potentiaali uudenlaiselle arvonluonnille, joka mahdollistaa sen, että organisaatiot voivat luoda ekosysteemejä, jotka hyödyntävät kolmansien osapuolten osaamista ja mahdollistavat innovaation ennennäkemättömässä mittakaavassa. Tämän johdosta on esitetty, että *government-as-a-platform* -malli, joka voidaan yksinkertaisesti määritellä julkiseksi palveluinnovaatioekosysteemiksi, voisi olla käänteentekevä ratkaisu julkisten palvelujen kehittämiseen.

Minkä tahansa alustan menestyksen kannalta kriittisin tekijä on sen kyky houkutella eri toimijoita osallistumaan alustan käyttöön ja kehitykseen, koska itsessään alusta ei voi tuottaa arvoa. Tämän tutkimuksen tarkoituksena oli selvittää, miten julkinen palveluinnovaatioekosysteemi, *government-as-a-platform,* tulisi suunnitella, jotta eri toimijat, kuten yksityisen ja julkisen sektorin organisaatiot, haluaisivat osallistua siihen, ja kehittää innovatiivisia ratkaisuja julkisten palvelujen tuottamiseen.

Tutkimuksen empiirinen osuus toteutettiin tapaustutkimuksena, joka keskittyi sosiaali- ja terveydenhuollon toimialaan. Tutkimusaineisto kerättiin haastattelemalla suomalaisia yksityisen ja julkisen sektorin edustajia. Analyysi toteutettiin iteratiivisena prosessina, jonka vaiheita olivat aineiston litterointi, luokittelu ja koodaus sekä lopulta synteesi. Lisäksi tutkimustuloksia verrattiin olemassa olevaan kirjallisuuteen tulosten validiteetin parantamiseksi.

Tutkimustulokset osoittavat, että alusta, joka on avoin, joustava, läpinäkyvä ja saavutettava houkuttelee osallistujia. Myös nopeiden, helppojen ja ketterien prosessien sekä alustaan liittyvän informaation havaittiin olevan kriittisiä osallistujien houkuttelun kannalta. Osallistujien motivaatioiden osalta julkisuus ja tunnettavuus, oppiminen, tiedon jakaminen sekä hyvän tekeminen kannustavat osallistumaan julkisen sektorin alustaekosysteemiin. Lisäksi tutkimustulokset paljastivat, että alustan tarjoamiin hyötyihin liittyvät tekijät, kuten markkinoille pääsy ja toiminnan tehostaminen, kannustavat toimijoita liittymään alustaekosysteemiin. Alustojen toiminnan kannalta on myös tärkeää, että niitä tukeva infrastruktuuri, sisältäen prosessit, organisaatiorakenteet, lainsäädännön, johtamisen ja yhteisen vision, on olemassa.

Avainsanat digitaalinen alusta, alustaekosysteemi, digitalisaatio, innovaatio, julkiset palvelut

DEFINITIONS

Platform	A platform is a system of systems which provides an open, participative infrastructure upon which different actors, including users, providers and others across organizational boundaries, can engage in value-adding activities in a multi-sided market environment governed by agreed boundary resources (Mattila et al., 2016; Parker et al., 2016; Seppälä et al., 2015).
Ecosystem	An ecosystem is a collection of organizations engaged in joint production, whose choices and actions are interdependent (Boudreau & Hagiu, 2008). The platform ecosystem consists of the *platform leader* and its *complementors* (see separate definitions).
Platform leader	A platform leader is an organization that has successfully established its product, service or technology as an industry platform and is in a position where it can influence the development of the overall technology and business system of which the platform is a core element (Gawer & Cusumano, 2014).
Complementors	Complementors are organizations that make supporting products and services that expand the platform's market (Cusumano & Gawer, 2002).
Boundary resources	Boundary resources are interfaces between the platform provider and third parties, that facilitate the use of the core platform functionality to build complementary innovations and guide the behavior of platform complementors (Boudreau & Hagiu, 2008; Ghazawneh & Henfridsson, 2013; Seppälä et al., 2016). They include for example technical standards and interfaces, guidelines and documentation.

Government-as-a-platform	In this study, government-as-a-platform refers to a technology-enabled government service innovation ecosystem. More specifically, government-as-a-platform is a higher-level platform that consists of several smaller connected platforms or micro-entities, which represent different industry-level platforms within the public sector. Together these entities form an open innovation ecosystem, in which both public and private sector actors can create innovative solutions for delivering public services in an improved way. A fundamental characteristic of the platform is citizen-centricity, meaning that the main purpose of the platform is to provide the best possible solution for the citizen's need.

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1 INTRODUCTION

What if you could get all the public services you wanted from one place instead of visiting several websites or offices? And what if you could get these for an optimal price, at the most optimal time and the most optimal place? Soon this could be possible.

Platforms are the quintessence of today's digital world. They are transforming every dimension of life, changing the way we work, move, live and do business (Accenture, 2016a). Furthermore, digital platforms and related technological innovations have changed boundaries, the logic of value creation, tasks and power structures of existing industry ecosystems, as well as the nature of competition in different markets, including trust between different players and their competitive advantages (Kenney & Zysman, 2016; Mattila et al., 2016; Seppälä et al., 2015). Indeed, it has been argued that platforms represent the largest transformation in the global economy since the Industrial Revolution (Accenture, 2016a; Kenney & Zysman, 2016), rapidly changing business models and information technology architectures across traditional industry boundaries (Hagiu & Wright, 2013; Parker et al., 2016; Seppälä et al., 2015).

What really demonstrates the power of platforms is that currently, the world's most valuable companies are platform businesses and overall, the market value of platform businesses exceeds 4.3 trillion dollars (Evans & Gawer, 2016). The core driver for the success of platforms is their ability to provide potential for a new kind of value creation (Parker et al., 2016). Platforms allow organizations to create entire ecosystems, which unlike traditional business models leverage the expertise of a diverse pool of external complementors, relocating the locus of innovation from in-house development to a network of actors (Cusumano & Gawer, 2002, Gawer & Cusumano, 2014; Kenney & Zysman, 2016; Parker & Van Alstyne, 2008; Parker et al., 2016; Tiwana, 2014; Van Alstyne et al., 2016). By providing an open and participative infrastructure that facilitates interactions among different actors, platforms not only create value for themselves, but for all participants (Parker et al., 2016). As a result, platforms can create completely new markets and disrupt existing ones, resulting in significant economic and societal impacts (Ailisto et al., 2016; Evans & Gawer, 2016; Hagiu & Wright, 2013; Kenney & Zysman, 2016).

Another distinct characteristic of platform business models is that they are not only used by technology-oriented or born-digital organizations, but their potential is recognized by leaders across industries (Accenture, 2016a; Deloitte, 2015). IDC (2015) has predicted that by 2018 more than 50 percent of large enterprises will either create industry platforms, partner with industry platforms, or both. Indeed, thus far, the platform revolution has transformed only a handful of industries, leaving many of the most important areas of our economy, our society, and our lives largely unaffected. Moreover, in these sectors, which include for example education, government, healthcare, finance, energy and manufacturing, the platform revolution is only beginning, and the largest transformation is yet to come (Parker et al., 2016).

In 2009, Tim O'Reilly was first to present the idea of government-as-a-platform (also known as Government 2.0) defining it as 'the use of technology to better solve collective problems at city, state, national and international level' by making government an open platform that allows people inside and outside government to innovate and generate unforeseen value-adding solutions, for example with open government data (O'Reilly, 2011). Later on, Janssen and Estevez (2013) introduced a comparable idea with their lean government (l-government) concept, in which public organizations introduce platforms that facilitate innovation between public sector organizations and third parties, and take an orchestration role in the collaborative ecosystem. More recently, Accenture (2016b) has defined government-as-a-platform as 'the foundation that allows government and non-government organizations to deliver next-generation public services'. They explain that in the government-as-a-platform model, the government takes the role of an intermediary that orchestrates participants, facilitates collaboration and connects people and providers, while data is the foundation of public-private collaboration, driving development and innovation. A similar conceptualization is made by Williams et al. (2015, 2016), who see government-as-a-platform as a model that allows governments to share IT resources more efficiently, and to unlock data and functionality through application programming interfaces (APIs), allowing third parties to create improved public services. Parker et al. (2016) also support the idea of government-as-a-platform, acknowledging that the government has characteristics that make it ready to join the platform revolution: it is information-sensitive, surrounded by gatekeepers, fragmented, and marked by information asymmetries.

Overall, government-as-a-platform has been stated to represent a shift in efficiency, effectiveness and transparency, moving agencies from today's silos to collaboration across industry boundaries. According to Williams et al. (2015, 2016) embracing government-as-a-platform would allow the government to create services more efficiently, improve integration of public services, attract citizens to public services and provide opportunities to flexibly leverage latest technologies in service development. Nevertheless, industry experts have pointed out that transforming the government is not an easy task, as regulatory and budgetary constraints among other things complicate the application of platform thinking in the government context (Parker et al., 2016; Williams et al., 2015). Furthermore, the realization of the government-as-a-platform model requires a radical transformation of people, processes and organizations in the public sector (Accenture, 2016b).

In general, government-as-a-platform can be defined as a technology-enabled government service innovation ecosystem. More specifically, I define government-as-a-platform as a larger higher-level platform, which consists of several connected smaller platforms or micro-entities, which represent different industry-level platforms within the public sector. A fundamental characteristic of the platform is citizen-centricity, meaning that the main purpose of the platform is to provide the best possible solution for the citizen's need. Figure 1 below depicts the idea.

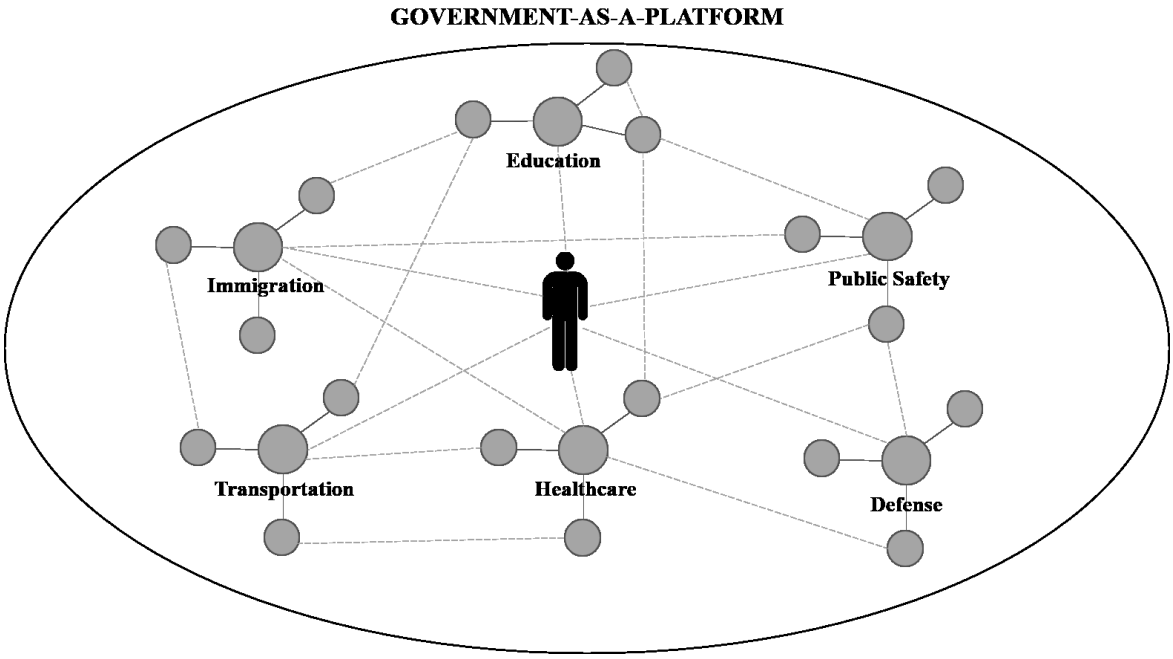

Figure 1. Government-as-a-platform[1]

Given the strong track record of platform businesses and their exceptional value creation potential, the government-as-a-platform model could be a revolutionary solution for delivering public services in an improved way, particularly in Finland where digitalizing public services is strongly on the government agenda (Prime Minister's Office, 2015, 2016). Moreover, Finland was ranked 5th in the United Nations E-government Survey 2016, which measures development of e-government in countries around the world by looking at a number of features related to online service delivery, including for example one-stop-shop government service delivery, open government data, e-participation, multi-channel service delivery, mobile services as well as innovative partnerships through the use of ICT (United Nations, 2016). The European Commision has also ranked Finland among countries with the highest level of eGovernment maturity in the EU, measured in terms of penetration, i.e. Internet use to interact with public administration, and digitalization, i.e. percentage of automated services (European Commission, 2016). These measures demonstrate that Finland could be ready for adopting government-as-a-platform in the near future, and indeed, according to Ailisto et al. (2016), Finnish organizations have good prerequisites for succeeding in the platform economy.

[1] The platforms presented in the figure represent hypothetical industry-level platforms within the public sector.

Overall, the current understanding of government-as-a-platform is limited, as very little research on the idea exists yet. Therefore, new research is needed to advance the field and understand the potential of platform thinking in the government context as well as the key requirements for a successful implementation of government-as-a-platform.

1.1 Objectives of the study

The most critical determinant of platform success is its ability to attract participants to join and contribute to it, since on its own a platform cannot create value (Gawer & Cusumano, 2008). Furthermore, it has been stated that an increased number of platform users results in increased platform value (Eisenmann, 2008; Eisenmann et al., 2006; Gawer & Cusumano, 2014; Parker & Van Alstyne, 2008; Porch et al., 2015; Van Alstyne et al., 2016), and that motivation factors of participants need to be understood to make a platform successful (Antikainen et al., 2010; Antikainen & Väätäjä, 2010; Battistella & Nonino, 2012; Tiwana, 2014). Thus, the main objective of this study is to discover how a government service innovation ecosystem, or government-as-a-platform, should be designed, so that different groups of actors, such as public and private sector organizations, would want to contribute to the platform, and generate innovative solutions for delivering public services in an improved way. The research problem is as follows:

How can a government successfully encourage other actors to join their ecosystem and to develop beneficial complementary innovations?

More specifically, the study focuses on the Finnish context, and intends to answer the following research question:

RQ: What are the factors that encourage Finnish public and private sector actors to contribute to a government service innovation ecosystem (government-as-a-platform)?

Due to the underresearched nature of the topic, another objective of this study is to build conceptualizations on the government-as-a-platform idea, and identify potential further avenues for research. Moreover, the intention is to build conceptualizations that could potentially be used as a basis for further empirical studies on the topic, as the scope of the empirical part of my study is limited for broader generalizations.

1.2 Structure of the thesis

This thesis consists of six separate chapters. Next, in the second chapter, I review earlier academic literature that is relevant for the purpose of this study. Furthermore, I discuss platforms in general, mechanisms used to attract platform participants as well as motivations to participate in platform ecosystems. In the end of the chapter, I summarize the findings of the literature review. Based on them I present a theoretical framework which provides a comprehensive overview of potential factors encouraging platform contribution.

In the third chapter, I introduce the methodology of my study. Furthermore, I explain and justify my research approach, research context and sample, as well as data collection and data analysis methods. In the end of the chapter, I also evaluate my research using tests that are commonly used in evaluating empirical social research.

In the fourth chapter I introduce the findings of my empirical study, which focused on the healthcare industry. The chapter is divided into four sub-sections. First, I present the views of the interviewees on the state of digitalizing public services in Finland and the government-as-a-platform model. Next, I outline the factors that encourage the platform provider to create a platform ecosystem, as well as the mechanisms they use to attract participants to the platform ecosystem. Finally, I introduce the factors that encourage platform contributors, namely health tech startups (private sector point of view) and public sector organizations, to contribute to the platform ecosystem.

The fifth chapter of this thesis focuses on in-depth analysis and discussion of the research findings. The aim of the chapter is to align the views of different platform sides, and to compare them with existing literature. Based on the analysis, I provide a revised version of the theoretical framework.

Finally, the sixth chapter concludes this thesis. First, I summarize the main findings of my study, and present their practical implications. I then conclude by discussing the limitations of my study and providing a set of suggestions for further research.

2 LITERATURE REVIEW

In this chapter, I review the most relevant theoretical literature for this study. First, I discuss the platform concept, and identify an appropriate definition of the term for the purpose of this study. Next, I introduce some key concepts related to industry platforms in more detail, to provide a comprehensive view of the topic. I then explore the mechanisms that platforms use to attract participants to join them, and finally conclude the chapter by looking at motivations that drive platform contribution.

2.1 Platform definitions

The platform concept is used widely in different contexts and industries, and is especially popular in the ICT industry (Evans, 2003; Gawer & Cusumano, 2014; Porch et al., 2015). Thanks to their pervasiveness and value-creation opportunities, platforms have become the center of attention of a broad range of academic scholars and disciplines (Porch et al., 2015), as well as entrepreneurs and investors (Hagiu, 2014). Consequently, the use of the term 'platform' has experienced exponential growth and has become nearly ubiquitous (Gawer & Cusumano, 2014). Moreover, the usage of the term has increased especially during the last two decades (Thomas et al., 2014), even though platforms have prevailed for hundreds of years (Staykova & Damsgaard, 2015), demonstrating the topicality of the phenomenon. Consequently, platform research has been described as a multidisciplinary and emerging domain, with a substantial amount of literature that is growing fast (Porch et al., 2015).

As the topic of platforms is broad and pervasive, the literature remains fragmented (Porch et al., 2015), with inconsistency on the definition of 'platform' (Kenney & Zysman, 2016; Thomas et al., 2014). As a consequence, it can sometimes be unclear what authors define as a platform (Porch et al., 2015). Thus, I will next review the different meanings for the term 'platform' presented in existing literature, with the aim to discover a suitable definition for the purpose of this study.

On a higher level, a platform can be defined as a system of systems, that allows different actors, including users, providers and others across organizational boundaries, to engage in value-adding activities (Mattila et al., 2016). Furthermore, 'the platform provides an open, participative infrastructure for these interactions and sets governance conditions for them'

(Parker et al., 2016:5). These platform systems differ in structure and appearance, meaning that they can be either physical (eg. shopping mall) or virtual/digital (eg. online store) (Baldwin & Woodard, 2009). This study will focus on digital platforms, which have been defined as

> 'information technology systems upon which different actors - that is, users, service providers and other stakeholders across organizational boundaries - can carry out value-adding activities in a multi-sided market environment governed by agreed boundary resources' (Seppälä et al., 2015).

This definition of platforms is consistent with my view on government-as-a-platform as a technology-enabled innovation ecosystem. Nevertheless, it should be noted that even though most of today's platforms are digital, they are not necessarily purely digital, but may have physical elements included in their offering (Evans & Gawer, 2016). This is also the case in the government-as-a-platform model, which is powered by digital technologies, but consists of physical elements too.

Over time, definitions of platforms and the platform economy have evolved in three phases. First, platforms were regarded as product platforms that served as the basis for creating different types of product families. In the second phase, platforms were initially defined as control points in industrial networks, through which income was generated without creating value while harming the economy of the entire network, an example being the Windows operating system. Later on in the second phase, platforms were defined as products, services or technologies developed by one or more organizations that provide a basis for third parties to create complementary innovations. Finally, in the third phase platforms were defined as intermediaries or marketplaces facilitating interactions between two or more parties (Seppälä et al., 2015). Indeed, more recently, the idea of platforms as multi-sided markets or networks, which sees platforms as products or services that bring together groups of users, and enable or facilitate interaction between them, has become more prevalent (Armstrong, 2006; Boudreau & Hagiu, 2008; Eisenmann et al., 2006; Evans, 2003; Gawer & Cusumano, 2014; Hagiu, 2014; Hagiu & Yoffie, 2009; Rochet & Tirole, 2004; Seppälä et al., 2015; Tiwana, 2014), while the idea of platforms as a basis for complementary innovations also prevails (eg. Hagiu & Yoffie, 2009; Gawer & Cusumano, 2014; Tiwana et al., 2010, Tiwana, 2014;

Seppälä et al., 2015). This combination of multi-sidedness and reliance on complementary innovations is well covered in the recent digital platform definition of Seppälä et al. (2015) presented earlier.

As demonstrated by the evolution of the platform definition, platforms can be defined based on the context in which they exist. Furthermore, platforms can be part of one firm or a supply chain, or they can extend to ecosystems including thousands of organizations (Baldwin & Woodard, 2009; Gawer, 2014; Gawer & Cusumano, 2014; Porch et al., 2015; Thomas et al., 2014). Based on these contexts, researchers have presented different approaches to categorize platforms.

Gawer and Cusumano (2014) divide platforms into two main forms: internal (company-specific) platforms and external (industry-wide) platforms. They define internal platforms as 'a set of assets organized in a common structure from which a company can efficiently develop and produce a stream of derivative products' (p.2) while by external platforms they mean 'products, services or technologies that are similar to the former but provide the foundation upon which outside firms can develop their complementary products, technologies, or services' (p.4). Thus, the main difference between the two is that external or industry platforms are open to outside innovation, while internal platforms are more closed.

In their systematic literature review, Porch et al. (2015) ended up in a similar classification of platforms to two types: interior and exterior platforms. Like Gawer and Cusumano (2014), Porch et al. (2015:9) define interior platforms as 'processes, designs and capabilities of developing product families from a core underlying platform comprised of subsystems and interfaces' within an organisation. Furthermore, they list innovation, modularity and economies of scope as key characteristics of interior platforms. With exterior platforms the definition of Porch et al. (2015) is also similar to that of Gawer and Cusumano (2014), namely 'uses outside of the organisation that facilitate complementary product or service development by third parties (complementors) and interaction between distinct participant groups to form multi-sided markets' (p.10). Consequently, the authors argue that the main difference between interior and exterior platforms is that the latter are more complex and its value chain is not as linear due to reliance on complementary innovations. Porch et al. (2015)

also highlight that network effects, their orientation and type are a central theme in the exterior platform literature, as well as pricing considerations. Overall, what is interesting in this distinction to internal and external or interior and exterior platforms, is that currently Boudreau (2010, 2012) is the only author that has bridged the gap between the two views (Porch et al., 2015).

Besides the categorization into internal and external platforms, different management disciplines have presented differing views on platforms. Generally, platforms can be divided into the economics and engineering perspective, which see platforms in different ways. The economics perspective views platforms as double-sided markets that facilitate exchanges between different consumers that could not otherwise transact with each other, while the engineering design perspective views platforms as technological architectures or modular systems that facilitate innovation (Gawer, 2014). Gawer (2014) proposes an integrative framework for technological platforms which bridges the economics and engineering perspectives. Based on her synthesis, she argues that platforms can be seen as evolving organizations or meta-organizations that perform three functions: 1) they federate and coordinate constitutive agents who can innovate and compete, 2) they create value by generating and harnessing economies of scope in supply or/and demand, and 3) they entail a modular technological architecture composed of a core and periphery. Consequently, Gawer (2014) suggests that technology platforms can be classified into three types based on different organizational forms: internal platforms (within organizations), supply chain platforms (across supply chains) and industry platforms (across industry innovation ecosystems). Each type has its distinct characteristics, namely constitutive agents, interfaces, accessible innovation capabilities, and coordination mechanisms. The main difference between her categorization and those of Gawer and Cusumano (2014) and Porch et al. (2015), is the distinction between supply chain platforms and industry platforms, which both are considered external or exterior platforms in the other categorizations.

Finally, Thomas et al. (2014) present an alternative approach for categorizing platform literature by identifying four distinct research streams in their systematic review on platform literature. These include organizational capability platforms, product family platforms, market intermediary platforms, and technology system platforms. The first stream, organizational capability, views a platform as a structure that stores an organization's

capabilities, which are the primary driver of value creation. The second and most dominant stream is the product family stream, in which the core value drivers are operational efficiency, flexibility and scale economies. In the third stream, market intermediary, value is created with market power, by leveraging network externalities and identifying the optimal product or service design to facilitate interaction between participants. Finally, the fourth stream, technology system, is the most broad-based and heterogeneous one, and focuses on the platform as the hub of a technology system. What can be seen from these categorizations is that ultimately, they are also divided into internal and external platforms, with organizational capability platforms and product family platforms included in the former, and market intermediary platforms and technology system platforms in the latter. Thus, it can be concluded, that recent literature reviews have ended up with fairly similar and interconnected conclusions.

Regardless of the distinction of platforms into different types, scholars have described some characteristics that are common to all platforms. Moreover, it has been noted that all platform types have the same fundamental technological architecture, which is based on a modular design and consists of a core and periphery (Baldwin & Woodard, 2009; Gawer, 2014; Staykova & Damsgaard, 2015). The core forms the platform with components that have low variety, while the periphery is consisted of complementary, high variety components. The interoperability of the core and the periphery is then again enabled by design rules, which govern the relationships among components (Baldwin & Woodard, 2009). Even though all platforms consist of a core and periphery, they are built differently, as the platform sides and the interfaces between them can be organized in several ways. Thus, platform-based organizations have a high level of differences in their structures, evolutionary paths and business models (Staykova & Damsgaard, 2015).

Table 1 below summarizes the connections between different platform types presented in existing literature. Overall, the findings demonstrate the complex context in which platforms exist, and help to illustrate the interconnectedness of different literature stream, and the similarities of their conclusions. Furthermore, they provide a broad overview of the platform literature, which is a good starting point for exploring more specific platform-related issues in depth.

Table 1. Platform types

	Closed ← → Open			
Gawer & Cusumano, 2014	Internal (company or product)		External (industry)	
Porch et al., 2015	Interior		Exterior	
Thomas et al., 2014	Organizational	Product family	Market intermediary	Technology system
Gawer, 2014	Internal (one firm)		Supply chain (assembler & supplier)	Industry (platform leader & complementors)
	Modular design Core and periphery			

In my research, I will focus on industry platforms and their characteristics, since I define government-as-a-platform as a cross-industry innovation ecosystem. Thus, in the following sections, I will discuss the key concepts related to industry platforms and their implications for platform contribution.

2.2 Industry platforms

An industry platform is defined as 'a foundation technology or service that is essential for a broader, interdependent ecosystem of businesses' (Gawer & Cusumano, 2008: 28). Furthermore, to be worthwhile, the platform is dependent on complementary innovations, and vice versa. Thus, it is not solely controlled by the platform originator, regardless of possible proprietary components (Gawer & Cusumano, 2008). Indeed, one of the main differences between industry platforms and internal platforms is that industry platforms are designed so that they offer the core structure which others can use to create complementary innovations, resulting in unknown end results and an unprecedented scope for innovation (Gawer & Cusumano, 2014). In fact, it has been stated that leveraging external expertise on an unprecedented scale is one of the core characteristics of the platform economy (Tiwana et al., 2010, Tiwana, 2014), and that in recent years the greatest profits have been achieved with platforms that are open to complementary innovations that bring added value to customers (Seppälä et al., 2015).

The companies that make supporting products and services that expand the platform's market are known as complementors (Cusumano & Gawer, 2002). The main benefit of leveraging the expertise of outside complementors is that they may possess skills and capabilities that the platform provider itself does not have, and thus may develop innovations that the platform's original designers did not even think of (Baldwin & Woodard, 2009; Tiwana et al., 2010). Furthermore, together the platform provider and its complementors can create an innovation ecosystem, which can significantly increase the value of the platform for everyone thanks to a larger amount of participants joining the ecosystem (Cusumano & Gawer, 2002; Evans & Gawer, 2016; Gawer & Cusumano, 2008; Parker & Van Alstyne, 2008).

Next, I discuss the key concepts related to industry platforms, and their implications for the focus of this study. I start by discussing the concept of platform leadership, which is a key concept related to industry platforms. After that, I will move on to discuss the concepts of multi-sided markets and network effects, which are central topics studied in platform literature, and important for understanding how platforms function and create value.

2.2.1 Platform leadership

A key concept related to industry platforms is that of platform leadership, which is defined as the ability of a company to drive industry-wide innovation for an evolving system of separately developed pieces of technology (Cusumano & Gawer, 2002). Platform leaders can be described as

> 'organizations that manage to successfully establish their product, service, or technology, as an industry platform and rise to the position where they can influence the trajectory of the overall technological and business system of which the platform is a core element' (Gawer & Cusumano, 2014:9).

There are several requirements for becoming a platform leader. First of all, a compelling vision of the future that is understood and embraced by platform complementors is needed (Cusumano & Gawer, 2002; Gawer & Cusumano, 2008, 2014). This vision can also be understood as a shaping strategy, which aims to create incentives and capabilities for large-scale distributed innovation (Hagel et al., 2008).

To succeed, a shaping strategy requires a critical mass of participants, which can be obtained and mobilized quickly with the help of three interrelated elements: 1) the shaping view, which is a broad and clear perspective of the direction of the market or industry that expresses the value-creation opportunities for all participants, 2) the shaping platform, which is a set of clearly defined standards and practices that allow organizing and supporting activities of several participants, providing leverage that enables participants to do more with less, and 3) the shaping acts and assets, which the shaping company uses to demonstrate its capabilities to succeed and its non-competitive position towards participants. Overall, a good shaping platform increases functionality, decreases adoption costs and accelerates revenue creation for participants, encouraging distributed innovation that helps to build a rich ecosystem. Furthermore, pursuing a shaping strategy requires risk taking, unique insights on the market changes, and a strong management that can drive and encourage the strategy implementation and coordinate efforts with third parties (Hagel et al., 2008).

Besides a compelling vision, another requirement for platform leadership is platform potential of the platform owner's product or service. More specifically, the platform owner's product or service has to meet two conditions in order to have platform potential: 1) perform at least one core function within a "system of use", or solve a critical technological problem within an industry, and 2) be easy to connect to or to build upon to extend the system of use and enable new and unplanned end-uses. The first condition is met if the system cannot function without the product or technology, while the second one is fulfilled for example if external actors have succeeded in developing complements to it (Gawer & Cusumano, 2008).

Finally, a third requirement for platform leadership is that the strategy of the aspiring platform leader responds to both the technology and business aspects of platform leadership. Technological aspects include design of platform architecture and interfaces, and selective disclosure of intellectual property so that they facilitate development of complements by third parties, while business aspects consist of production of key complements or introduction of incentives for complement creation for third-parties (Gawer & Cusumano, 2008).

2.2.2 Multi-sided markets

Recently, the idea of multi-sided markets has become an increasingly common concept for the use of the term platform. It views platforms as intermediaries or marketplaces that facilitate interactions between two or more participant groups, and thus often refers to multi-sided platforms (Armstrong, 2006; Boudreau & Hagiu, 2008; Evans, 2003; Gawer & Cusumano, 2014; Hagiu, 2014; Hagiu & Yoffie, 2009; Rochet & Tirole, 2004; Seppälä et al., 2015; Tiwana, 2014). More specifically, multi-sided platforms can be defined as technologies, products or services that create value mainly by facilitating direct interactions between two or more participant groups and decreasing their search and transaction costs (Hagiu, 2014), without taking ownership of the products or services whose transaction they facilitate (Hagiu & Yoffie, 2009). Thus, their operating costs are low and margins high (Hagiu & Wright, 2013).

Furthermore, multi-sided platform markets have been recognized as increasingly important (Evans, 2003), and indeed, they include some of the most powerful, valuable and fastest-growing businesses of the past decade (Evans & Gawer, 2016; Hagiu & Wright, 2013; Hagiu, 2014). As a result, the phenomenon has even been referred to as the multi-sided platform bubble (Hagiu & Wright, 2013). The main reason why multi-sided platforms have become so powerful and widespread, and thus important for all organizations today, is the rise of the internet and related technologies (Hagiu & Yoffie, 2009; Hagiu & Wright, 2013). Moreover, new multi-sided marketplaces are created every day, making it easier for different parties to interact with each other directly, disrupting and displacing traditional business models (Hagiu & Wright, 2013).

Overall, multi-sided markets are fairly similar to industry platforms, and thus most of the literature related to them is appropriate for studying industry platforms. Still, it is important to note that they are two distinct concepts, as not all multi-sided markets are facilitating external innovations by their existence (Gawer & Cusumano, 2014).

2.2.3 Network effects

A key concept widely discussed in platform literature is network effects, which characterizes the dynamics between platform sides (Gawer, 2014). Network effects can be defined as 'the impact that the number of users of a platform has on the value created for each user' (Parker

et al., 2016:17). They can be both direct (same-side) or indirect (cross-side) (Evans & Gawer, 2016; Gawer & Cusumano, 2014; Hagiu, 2014; Parker et al., 2016; Porch et al., 2015; Seppälä et al., 2015; Tiwana, 2014). Direct network effects refer to the effect of users on one side of the platform to users on the same side of the platform, while indirect network effects are the effect of users on one side of the platform to users on another side of the platform (Parker et al., 2016; Tiwana, 2014). Additionally, network effects have two types of orientations - positive and negative - which determine the utility of the platform for participants. Positive network effects increase the overall value of the platform for the participant, while negative network effects have a reverse effect, decreasing the value of the platform for a participant as additional participants join the platform. As positive network effects are the main source of value creation for platforms, they are also a key source of competitive advantage for platform businesses, and thus they are more discussed in platform literature than negative network effects (Porch et al., 2015; Parker et al., 2016).

Overall, network effects can be divided into four types based on the platform side they concern and their orientation: positive same-side effects, negative same-side effects, positive cross-side effects, and negative cross-side effects, which are summarized in Figure 2 below.

Side	*Orientation*	**Positive**	**Negative**
	Same-side	Positive same-side effects	Negative same-side effects
	Cross-side	Positive cross-side effects	Negative cross-side effects

Figure 2. Four types of network effects

Positive same-side effects increase the value of the platform for users on one side as the number of users on that side increases, while negative same-side effects have a reverse effect. Similarly, positive cross-side effects increase the value of the platform for users on one side as the number of users on another side increases, while negative cross-side effects have a

value-decreasing effect (Parker et al., 2016). Overall, as the number of platform users increases, the platform becomes more valuable as a result of better access to a user network and potential complementary innovations, while a decrease in platform users decreases the value of the platform (Gawer & Cusumano, 2014; Eisenmann, 2008; Eisenmann et al., 2006; Porch et al., 2015). Furthermore, the more users the platform has, the more incentives there are for complementors to develop new complementary products and services, causing a virtuous cycle (Cusumano & Gawer, 2002; Evans & Gawer, 2016; Eisenmann et al., 2006; Van Alstyne et al., 2016). This type of virtuous cycle enables building a long-lasting network of users, which is a key factor that distinguishes network effects from other tools driving growth, such as price and brand effects. As a result, enabling positive network effects is a key determinant for platform success (Parker et al., 2016).

Overall, network effects represent a shift from supply economies of scale that were the source of value creation in the twentieth-century industrial era, to demand economies of scale. In the twenty-first-century Internet era, the most successful companies derive most of their value from the communities that participate in their platforms, rather than their cost structure. This means that the focus of organizations shifts from inside to outside, simultaneously shifting the focus of innovation from in-house to open innovation. In other words, companies themselves are no longer the source of value creation, but the ecosystems around them, making demand economies of scale the core source of positive network effects (Parker et al., 2016).

As platforms create value by facilitating interactions between two or more participant groups, their key value driver is the positive cross-side network effects they can enable. However, achieving positive cross-side network effects requires solving the chicken-and-egg-problem, which has been stated to be one of the most difficult challenges for multi-sided platforms (Hagiu, 2014), and to be especially strong when new users must make significant platform-specific investments (Eisenmann, 2008). Ultimately, the chicken-and egg problem means that no participant group will join without another (Evans, 2003; Eisenmann, 2008; Gawer & Cusumano, 2008; Tiwana, 2014), and consequently, a core meter for platforms is their ability to attract different parties to join the platform and the network (Seppälä et al., 2015). This is something that platforms can do in several ways, which is why in the following section I will discuss different participant attraction mechanisms in more detail.

2.3 Mechanisms for attracting platform participants

In this section, I introduce mechanisms that are used to attract participants to platforms. First, I will discuss pricing mechanisms, after which I will continue by looking at control and governance mechanisms. Finally, I will conclude the section by outlining what kind of architecture decisions platforms make to attract participants.

2.3.1 Pricing mechanisms

Different investment and pricing strategies play a central role in getting all platform sides on board and maintaining them on the platform (Evans, 2003). Pricing can also be an efficient way to control platform access, by limiting participation of unfavored participants (Hagiu, 2014).

In multi-sided markets, pricing is not determined by marginal costs or customer demand, but rather platform providers need to select a price for each side of the platform (Eisenmann et al., 2006). Furthermore, pricing is determined by considering the externalities on the other side of the platform, which is why standard pricing principles seldom apply to platforms (Rochet & Tirole, 2004). Most platform providers tend to follow pricing strategies that are strongly skewed towards one platform side through subsidization. Obtaining a critical mass on that side attracts other sides to join (Evans, 2003; Eisenmann, 2008; Gawer & Cusumano, 2008; Parker et al., 2016), thus solving the chicken-and-egg problem. Furthermore, in multi-sided markets, it is typical that there is a "subsidy-side", which pays less for joining the platform, and a "money side", which highly values the subsidy side users and thus is willing to pay more for participation (Eisenmann et al., 2006). In other words, platform leaders are sacrificing some of their profits in order to encourage third-party innovation, making it more challenging for them to profit financially from the innovations. Indeed, this trade-off between ensuring own profits and incentivizing third-party innovation can be considered as one of the most significant challenges for platform leaders (Gawer & Cusumano, 2008).

Essentially, subsidization strategies are used to create cross-side network effects in order to increase the value of the platform (Eisenmann et al., 2006). Subsidy-based pricing strategies are typical especially for new proprietary platform providers, who first subsidize some platform users to create positive feedback accelerated with network effects, and then, as other users join, they charge them fees that offset the subsidies. Moreover, they can do this

in several ways. One option is to utilize penetration pricing, which essentially means subsidizing early adopters to decrease their upfront investments, and allowing the platform provider to increase prices as the network reaches a critical mass of users. Another way to accelerate early growth of the user base is by securing exclusive affiliation of marquee users, that is users with many other users wish to interact, usually by granting some type of concessions to them. Finally, a third way to address the chicken-and-egg problem is leveraging in-house complements to attract users to the platform (Eisenmann, 2008).

While subsidization tends to increase positive cross-side network effects, same-side effects present challenges for pricing considerations, as well as the uncertainty related to which side (if either) should be subsidized and how much (Eisenmann et al., 2006). Armstrong (2006) argues that the side of the multi-sided market that derives greater value from interacting with the other side should be charged more by the platform, or alternatively platforms can charge fixed fees or per-transaction charges from participants. Hagiu (2014) on the other hand suggests that platforms should follow the following pricing principles: 1) charge a higher price from the less price-sensitive participant group 2) charge more from the group that derives larger benefits from the participation of other groups if there is no priced transaction between the groups 3) charge more from the group that gets higher value from the other group, if there is a priced transaction between the groups. In line with Hagiu (2014), Eisenmann (2008) states that the more price sensitive side should be subsidized and the side that values more the growth in the number of transaction partners on the other side of the platform should be charged more. In conclusion, the group that gains higher value should generally be charged more.

Finally, besides attracting participants to the platform, pricing can be used to control platform access, and to manage the quality of participants (Hagiu, 2014). In addition to pricing, platforms are also interested in the identity of different participants and the externalities they may create for other sides of the platform, as well as in the potential benefits they may gain from allowing competition on one side of the platform. As a result, platforms often enforce rules on the transactions between the participants, screen them in non-price related ways, and encourage intra-side competition to encourage positive externalities and discourage negative ones, often constraining one platform side in favor of the other. In other words, a common characteristic of platforms is to sacrifice profits by

limiting one participant side to improve attractiveness and regain losses on another side (Rochet & Tirole, 2004).

2.3.2 Control and governance mechanisms

As mentioned in the previous section, not only attracting a critical mass of participants is important, but also their quality, as it determines the strength of indirect network effects (Hagiu, 2014). As a result, besides pricing strategies, platform providers tend to leverage different types of non-pricing control and governance mechanisms to ensure the quality of complementors and their products and services (eg. Hagiu, 2014, Boudreau & Hagiu, 2008; Rochet & Tirole, 2004; Seppälä et al., 2015), and thus to avoid negative network effects (Parker et al., 2016). This in turn leads to a central governance challenge for platform owners, which is balancing between maintaining control and encouraging innovation (Gawer & Cusumano, 2014; Ghazawneh & Henfridsson, 2013; Tiwana et al., 2010; West, 2003). Platforms have two types of non-price governance rules they can use to regulate their participant groups: rules regulating 1) access to the platform, and 2) interactions on the platform (Boudreau & Hagiu, 2008; Hagiu, 2014; Van Alstyne et al., 2016). Essentially, rules regulating access to the platform aim to ensure that the "right" kind of participants are attracted to the platform, while rules regulating interactions try to guide participants to act in a desired way (Boudreau & Hagiu, 2014). These rules are known as boundary resources (eg. Ghazawneh & Henfridsson, 2013).

Boundary resources can be defined as interfaces between the platform provider and third parties, which consist of a combination of cooperative, legal, administrative, technological, informational, functional and other instruments (Boudreau & Hagiu, 2008; Ghazawneh & Henfridsson, 2013; Seppälä et al., 2015). They are needed to attract a broader, more heterogeneous group to develop and maintain different compatible platform components, and to guide the behavior of these actors (Seppälä et al., 2015). Boundary resources include for example establishing technical standards and interfaces, rules and procedures, defining the division of tasks, providing support and documentation and sharing information (Boudreau & Hagiu, 2008). Other examples of boundary resources are presented in Table 2 below.

Table 2. Cooperative and technical boundary resources

Cooperative and technical boundary resources	
Cooperative boundary resources • contracts between the platform owner and complementors Agreement on rights Agreement on intellectual property rights Common earnings logic Open data (for third parties) Guidelines and documentation (incl. user experience)	Technical boundary resources • multilayer technical compatibility Software development tools (SDKs) Application programming interfaces (APIs) Functional scripts

Translated from Seppälä et al. (2015: 6).

Overall, boundary resources are perceived as a powerful tool in reducing negative network effects by limiting and selecting platform participants and guiding their actions (eg. Ghazawneh & Henfridsson, 2013). The reason for this is that essentially, they have the capability to minimize costs associated with a number of externalities, including complexity, uncertainty, asymmetric information and coordination problems (Boudreau & Hagiu, 2008). More specifically, they have the ability to solve market failures, that is situations in which fair and mutually satisfactory interactions fail to occur, or unfair interactions do occur (Parker et al., 2016). These include: 1) "lemons market failure", meaning asymmetric information leading low-quality suppliers to drive out high-quality ones in the market, 2) excessive competition on one side of the platform reducing the incentive to invest in the development of high-quality products or services, and 3) platform participants failing to act in ways that produce positive benefits to the platform and other participants (Hagiu, 2014). Consequently, boundary resources should be enforced when one of these is present. In addition, the implementation of boundary resources has been seen as a way to lower barriers to entry to the platform, which encourages complementary innovation and generates broader positive network effects (Mattila et al., 2016). Thus, boundary resources, including both pricing and non-pricing instruments, play a crucial role in encouraging complementary innovation, and therefore their link to motivations for joining and contributing to a platform needs to be studied.

2.3.3 Platform architecture

Besides boundary resources, platform architecture, including high-level platform design and interface design as well as intellectual property, has an influence on the attractiveness of the platform among potential complementors, and thus the innovation potential of the platform. Moreover, the platform architecture determines the possible types of innovation and their costs (Cusumano & Gawer, 2002).

A key dilemma for platform providers is solving the trade-off between appropriability and adoption. More specifically, the platform provider needs to be able to appropriate itself some of the economic benefits of the platform, but it needs platform adoption to do that, which then again means sacrificing some of the benefits to other members of the platform ecosystem (West, 2003). Solving the trade-off means deciding the optimal level of openness, which is critical for organizations creating and maintaining platforms, as it determines the growth potential of the platform ecosystem (Boudreau & Hagiu, 2008; Cusumano & Gawer, 2002; Eisenmann, 2008; Evans & Gawer, 2016; Parker et al., 2016; Parker & Van Alstyne, 2008; West, 2003).

Essentially, the main difference between an open and a closed platform is that a closed platform is only limited to the internal part of the organization, while an open platform extends beyond that and incorporates external third parties who can self-select their tasks and rely directly on the market for their reward. This allows design freedom for the external third parties or "peripheral players", while freeing core players from some tasks, making the open platform ideal for decentralized innovation (Olleros, 2008). Indeed, the main benefit of increased openness is a higher increase rate of external innovation. Moreover, openness allows broader participation and increased user value, which results in better profitability and faster integration of new features to the platform. Furthermore, it has been found that platforms encouraging third-party innovation can grow faster than those that do not, since they can accelerate growth by capturing network effects and decreasing lock-in concerns of users (Parker & Van Alstyne, 2008). Nevertheless, a pitfall of more open platform strategies is their negative effect on revenues due to for example increased costs for technical efforts to achieve interoperability, and the fact that revenues are partially shared with other platform members (West, 2003). Still, it should be noted that profit sharing among platform

participants is crucial for ecosystem creation and evolution, and therefore inevitable (Seppälä et al., 2015).

A key concept related to platform openness is modularity, which means that 'the system is composed of units (or modules) that are designed independently but still function as an integrated whole'. (Baldwin & Clark, 1996 cited in Parker et al., 2016:55). This type of structure helps to manage complexity and to reduce interdependency between modules, thereby facilitating innovation (Gawer, 2014; Tiwana et al., 2010; Tiwana, 2014). Therefore, it has been stated that to succeed in the long run, platforms need to have a modular design, as modular systems allow independent design of subsystems, which can then be integrated to the whole system through well-defined standard interfaces, also known as application programming interfaces or APIs (Parker et al., 2016). Furthermore, a higher degree of modularity increases the innovative capability of the platform, as more sides adding value can be included in the initial value proposition of the platform (Ethiraj et al., 2008; Staykova & Damsgaard, 2015). What is more, modular architectures enable specialization, which drives improved operational efficiency (Thomas et al., 2014; Tiwana et al., 2010). Indeed, modular architectures have been found to reduce innovation costs, encouraging complementors to contribute to the platform. Furthermore, they are especially useful when the interfaces are open, even though this might provide competitors valuable information on the platform (Cusumano & Gawer, 2002), and thus facilitate imitation (Ethiraj et al., 2008). However, controlling the architecture can also be beneficial, if the platform leader wants to prevent an outsider from making complements. As such, there is a trade-off between secrecy and disclosure in fostering innovation on platforms, that the platform leader needs to solve to their advantage. Still, it is stated that disclosure is the best way to facilitate complementary innovation (Cusumano & Gawer, 2002), and overall, nearly modular structures tend to provide the best protection against competitive pressures while still enabling innovation (Ethiraj et al., 2008).

While adding new features and interactions can be an effective way to make the platform more useful and to attract new users, it is important to note that new features and interactions may lead to excess complexity, which on the other hand may be harmful for the platform (Parker et al., 2016; Tiwana, 2014). Thus, the core of the platform which includes the key functionalities should be developed slowly, while a faster pace of adaptations may be

allowed in the periphery, where functionalities are valuable only to particular users. The reason for this is that the user experience remains much cleaner, and the platform ecosystem may evolve faster (Parker et al., 2016).

Overall, frictionless entry, meaning the ability to quickly, easily join a platform and begin participating in value creation, is critical for encouraging platform participation, and enabling rapid platform growth. Furthermore, platforms must make it as easy as possible for participants to create and exchange valuable goods and services on the platform. From a technical point of view, this can be done for example by offering different types of tools that facilitate collaboration and sharing. Platforms can also facilitate interactions by reducing barriers to usage, for example by integrating essential functionalities and tools to the platform. Still, it should be noted that sometimes increasing barriers to usage, by for example introducing some type of quality control mechanism, has a positive effect on the platform. It all comes down to encouraging value-creating, desirable behaviors, and discouraging value-destroying, undesirable ones (Parker et al., 2016), as discussed in the previous sections.

Besides providing an easy access to the platform, it is also important for the platform leader to manage the relationships with its external complementors. Platform leaders should aim to simultaneously pursue consensus and control among key complementors, meaning that they should both identify the technical specifications and standards that make the platform work with the complementors products and services, while influencing the complementors' decisions on how everything works together through development generations. Reaching consensus in the industry requires one organization with control over interfaces taking charge of the process, and getting others to follow their example. This can be achieved by establishing trust among the industry players with a balancing act of collaboration and competition. More specifically, the platform leader should enable others to innovate on the platform, and do this by demonstrating to the complementors that it is acting on behalf of the whole industry, thus sacrificing its own short-term interests for the common good. This allows establishing credibility and consequently an opportunity to influence future technical standards and designs (Cusumano & Gawer, 2002). In other words, the platform leader should aim to build an active community around the platform and establish ecosystem relationships that are mutually beneficial for all participants (Gawer & Cusumano, 2014).

All in all, in order to succeed and create value, open platforms need to be flexible, fertile and accessible to accommodate many useful applications, while also being scalable and evolvable to enable growth and sustainability. According to Olleros (2008), in rapidly growing digital markets this is only possible if the open platform is decentralized and built around a lean core. The reason for this is that centralized solutions tend to have a heavy core that hinders rapid growth and scalability, while decentralized control enables flexibility and innovation. Furthermore, a centrally controlled platform might create resistance to contribute among complementors (Kenney & Zysman, 2016; Mattila et al., 2016). In other words, a platform leader who aims to build an open platform needs to resist the temptation to create most of the value on its own since this might harm the platform's scalability and evolvability. Instead, they should create a space for other actors to innovate and generate positive externalities (Olleros, 2008).

2.4 Motivations for platform participation

As discussed earlier, solving the chicken-and-egg problem, that is attracting participants to the platform, is one of the most critical challenges for platform providers (eg. Hagiu, 2014). Furthermore, a platform is worthless without participants even if it had a sufficient earnings logic, since without participants value and innovations cannot be created. Thus, for the platform provider, it is important to understand participant motivations and needs - why they would want to use the platform and contribute to it - to make the platform successful (eg. Antikainen et al., 2010; Antikainen & Väätäjä, 2010; Battistella & Nonino, 2012; Tiwana, 2014).

Being motivated means to be moved to do something, meaning that a person who is considered motivated is energized or activated towards an end. Motivations can vary in their level, that is the amount of motivation a person has, and their orientation, meaning the source of motivation that gives rise to action, which then again is used as a basis for categorizing motivations into different types (Ryan & Deci, 2000). Overall, there is a lot of research on motivations, and consequently several different theories to explain motivations. Since motivations as such are not the key focus of this study, I will concentrate on one of the most widely accepted and used distinctions of motivations, namely that between intrinsic and extrinsic motivations presented in the Self-Determination Theory (Ryan & Deci, 1985). The theory is based on what type of reasons and goals lead to action, i.e. the orientation of

motivation (Ryan & Deci, 2000). The reason for this is that the categorization has been used in recent studies on motivations for collective or open innovation (eg. Antikainen & Väätäjä, 2010; Battistella and Nonino, 2012; Lakhani & Panetta, 2007), and thus should also be appropriate for the platform context, as platforms have been shown to enable open and collective innovation (eg. Battistella & Nonino, 2012, Gawer & Cusumano, 2014; Parker et al., 2016; Seppälä et al., 2015; Tiwana et al., 2010). The appropriability in turn is something that I will be examining in the empirical part of my study.

Intrinsic motivations are defined as actions that are based on personal interest and pleasure, meaning that satisfaction is not driven by external pressures or rewards, but rather the activity itself (Deci & Ryan, 2000). They can be further divided into two dimensions: 1) individual-driven or enjoyment-based intrinsic motivations, such as sense of membership, entertainment and opportunity to express individual creativity, and 2) social-driven or obligation or community-based intrinsic motivations, such as interesting objectives and intellectual stimulations, and social responsibility (Battistella & Nonino, 2012). More examples of intrinsic motivations are listed in Table 3 below.

Table 3. Intrinsic motivations

Intrinsic individual-driven motivations	**Intrinsic social-driven motivations**
• Entrepreneurial mindset • Opportunity to express individual creativity • Care for community, sense of membership, altruism • Enjoyment, fun and entertainment • Sense of efficacy, influencing	• Interesting objectives and intellectual stimulations • Social responsibility, ideology, contribution to the greater good

List retrieved from Battistella & Nonino (2012)

Extrinsic motivations in turn are defined as activities that are performed to achieve separable outcomes (Deci & Ryan, 2000). Furthermore, they are driven by different types of incentives or rewards, that is financial or non-financial stimuli coming from the external environment. These affect individuals' motivational processes by satisfying their need and consequently encouraging them to a certain course of action or by being the reason for preferring one alternative over others (eg. Antikainen & Väätäjä, 2010). More specifically, these incentives

can be divided into tangible and intangible rewards, the former meaning material rewards such as money or products, and the latter meaning for example moral and symbolic rewards and social contacts (Roberts et al., 2006).

Another way to categorize extrinsic motivations is into economic, professional and social motivations. In this categorization, economic motivations are actions that lead directly or indirectly to economic advantages of contributors, such as monetary rewards, free products and services. Professional motivations are actions that lead to professional advantages, such as learning, recognition, enhancement of professional status and reciprocity, and social motivations are obligations and responsibilities that arise from the social environment of contributors that have effects on community, such as sense of obligation to contribute and social capital (Battistella & Nonino, 2012). Examples of extrinsic economic, professional, and social motivations are listed in Table 4 below.

Table 4. Extrinsic economic, professional and social motivations

Economic motivations	Professional motivations	Social motivations
• Monetary rewards • Free products • Free services	• Learning • Reputation • Recognition • Reciprocity, establishing exchange relationships	• Sense of obligation to contribute • Social capital

List retrieved from Battistella & Nonino (2012)

Overall, these categorizations into intrinsic and extrinsic motivations and further into more detailed types of motivations form a good basis for studying motivations for platform participation in more detail. As a basis for my study I will be using the categorization of motivations for collective innovation presented by Battistella and Nonino (2012) with some minor modifications, and develop it further based on my findings from empirical research. The modified categorization is presented in the following section as a part of the proposed theoretical framework.

2.5 Theoretical framework

The objective of this thesis is to understand the factors that encourage different actors to join and contribute to a government service innovation ecosystem, or government-as-a-platform. In this section, I present a summary of the main findings of the literature review, and based on them introduce a theoretical framework that I used as the basis of my empirical study.

One of the main challenges for platforms is attracting different participants to join, that is solving the chicken-and-egg problem (Hagiu, 2014). Moreover, attracting participants is critical for the success of any platform, since without participants, they cannot create value (Gawer & Cusumano, 2008). As a result, platforms use different kinds of attraction mechanisms to encourage participation and contribution from a wide range of actors. These mechanisms include pricing mechanisms, control and governance mechanisms as well as decisions related to platform architecture. In terms of pricing, different types of subsidization strategies have been found to be effective in attracting participants, especially in the early stages of platform ecosystem development (Evans, 2003; Eisenmann, 2008; Gawer & Cusumano, 2008; Parker et al., 2016). When it comes to control and governance mechanisms, platforms can attract participants to join for example with contractual agreements that provide access to information as well as with technological tools and functionalities (eg. Parker et al., 2016; Seppälä et al., 2015). Overall, pricing mechanisms as well as control and governance mechanisms are known as boundary resources, which are interfaces between the platform provider and third parties, and are important in attracting participants to the platform (Boudreau & Hagiu, 2008; Ghazawneh & Henfridsson, 2013; Seppälä et al., 2015). Finally, it has been found that open platforms leveraging a modular architecture are most effective in encouraging distributed innovation, and thereby attracting participants (Cusumano & Gawer, 2002). Together pricing mechanisms, control and governance mechanisms, and platform architecture decisions form the first part of the theoretical framework, which is named as *platform design.*

The second part of the theoretical framework consists of *participant motivations,* since it is important for the platform provider to understand participant motivations and needs in order to make the platform successful (Antikainen et al., 2010; Antikainen & Väätäjä, 2010; Battistella & Nonino, 2012; Tiwana, 2014). One of the most widely accepted and used distinctions of motivations in recent studies on motivations for collective or open innovation

(eg. Antikainen & Väätäjä, 2010; Battistella & Nonino, 2012; Lakhani & Panetta, 2007) is that between intrinsic and extrinsic motivations, which is based on what type of reasons and goals lead to action, i.e. the orientation of motivation (Ryan & Deci, 2000). Thus, the distinction should also be appropriate for the platform context, as platforms have been shown to enable open and collective innovation (eg. Battistella & Nonino, 2012, Gawer & Cusumano, 2014; Parker et al., 2016; Tiwana et al., 2010; Seppälä et al., 2015). Consequently, the second part of the theoretical framework is based on a slightly modified version of the categorization presented by Battistella and Nonino (2012), synthesized from recent literature reviews on motivations for collective innovation. The categorization divides intrinsic motivations further into individual-driven and social-driven intrinsic motivations, and extrinsic motivations into economic, professional and social motivations.

Overall, the theoretical framework provides a comprehensive overview of the potential factors that encourage platform participation by combining both factors related to the platform itself and the potential platform participants. Moreover, the empirical part of this study was made to discover the appropriateness of the theoretical framework in practice, and to see whether it requires some kind of modifications or additions to be more descriptive. The theoretical framework is presented in Figure 3 below.

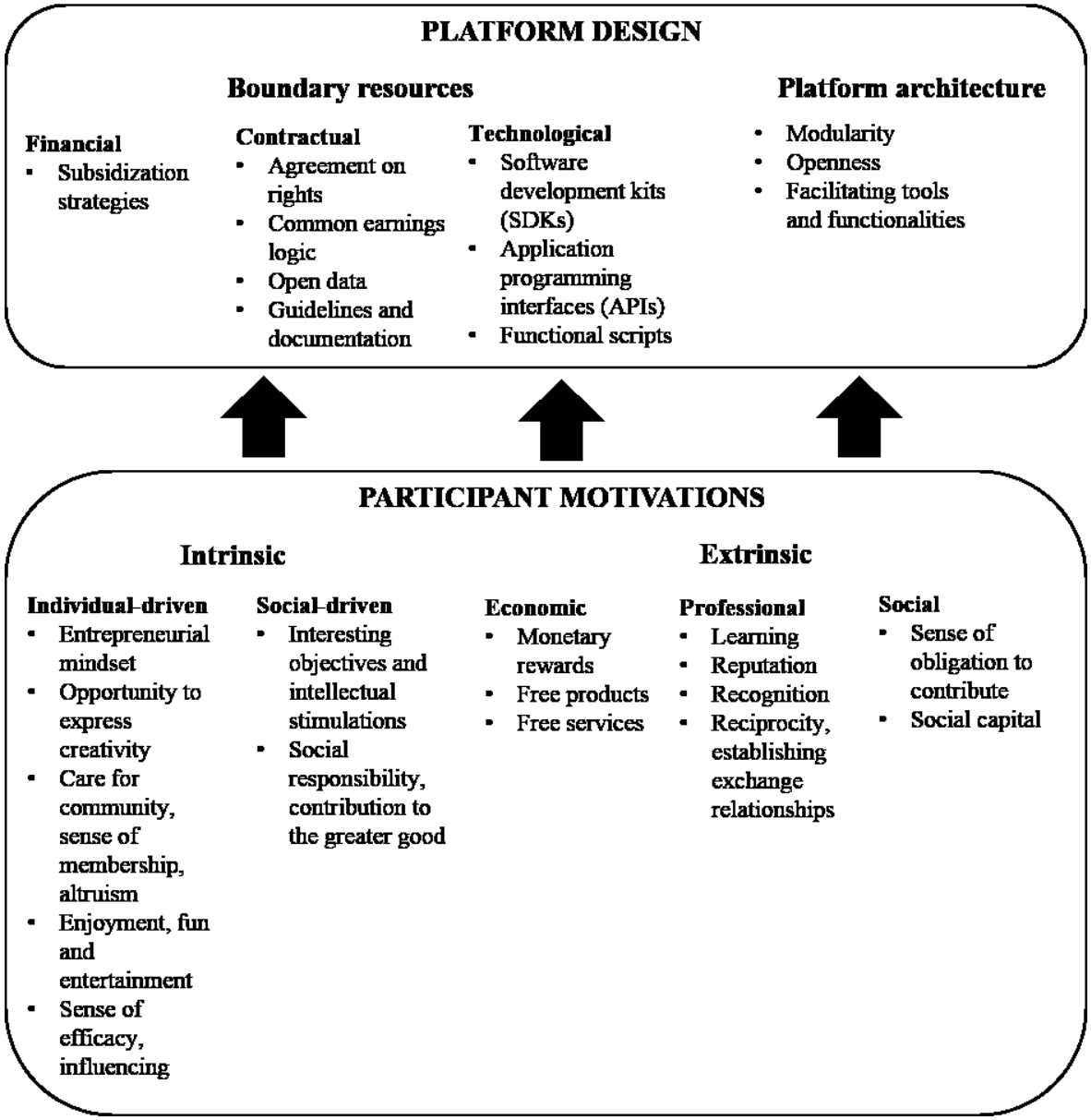

Figure 3. Theoretical framework

3 METHODOLOGY

The aim of this study was to discover how a government service innovation ecosystem, government-as-a-platform, should be designed in the Finnish context, so that different groups of actors, such as public and private sector organizations would want to contribute to the platform, and generate innovative solutions for delivering public services in an improved way. To address this research problem, the following research question was posed:

What are the factors that encourage Finnish public and private sector actors to contribute to a government service innovation ecosystem (government-as-a-platform)?

The question is important, since the concept of government-as-a-platform is relatively new and underresearched, and thus new research is needed to understand the potential of platform thinking in the government context. Furthermore, the government-as-a-platform model could be the needed solution for digitalizing public services in Finland, and thus this research has also a degree of societal importance.

In this chapter I introduce the methodology of my research. First, I start by explaining and justifying my research approach. Next, I elaborate on the research methods I used, including both data collection and analysis methods. Finally, I conclude the chapter by evaluating my research.

3.1 Research approach

All research methods are connected to the research philosophy that the researcher is following (Eriksson & Kovalainen, 2008). Thus, it is important to explain the philosophical assumptions guiding my research before elaborating on the research methods I have chosen to conduct my study. This makes it easier to understand why I have made certain choices on my research design.

The critical realist view (eg. Easton, 2010) best reflects my philosophical assumptions as a researcher. Its most fundamental aim is explanation, or answering what caused certain events to happen (Easton, 2010). In general, realist research aims to describe the world as accurately as possible and acknowledges that some observable 'facts' may be merely illusions.

Furthermore, critical realism allows some subjectivity in the production of knowledge as it asserts that our perception of the world is partly dependent on our beliefs and expectations (Gray, 2013). Moreover, critical realism assumes that there exists a reality "out there" independent of observers and accepts that the world is somewhat socially constructed. In other words, critical realists construe rather than construct the world, and acknowledge that reality breaks through at some point (Easton, 2010).

Due to limited existing research and theory, the nature of my study is exploratory theory building, as I intend to discover the key factors that would make a government-as-a-platform model work in the Finnish context, thereby generating new theory on the issue at hand. Moreover, as the concept of government as a platform has not been researched that much yet, most of the information related to it is based on opinions and ideas, which is most suitable to collect through interviews with a range of specialists from different fields. Indeed, it has been stated that more open and qualitative methods, and specifically exploratory studies, are more suitable for studying phenomena with limited prior insights (Eriksson & Kovalainen, 2008; Gray, 2013).

In my study, I used the case study methodology (eg. Eisenhardt, 1989; Yin, 2003), which is an appropriate research approach in new topic areas where little research exists, as it does not rely on previous literature or prior empirical evidence (Eisenhardt, 1989). Furthermore, the case study method allows presenting complex and sophisticated business issues - in my case the concept of government-as-a-platform - in a comprehensible way (Eriksson & Kovalainen, 2008). More specifically, case study research has been stated to be an appropriate research approach when addressing complex issues that are seen as challenging to study with quantitative methodologies (Ghauri & Grønhaug, 2005), since they allow retaining a holistic and meaningful view of real-life events (Yin, 2003). What is more, the advantage of case study research is that it allows theory building, often generating novel, testable and empirically valid theories (Eisenhardt, 1989). Still, it is important to note that building theory from case study research also has its weaknesses, namely the possibility of yielding overly complex, or narrow and idiosyncratic theory (ibid).

Following previously suggested definitions (e.g. Janssen & Estevez, 2013; O'Reilly, 2011), I define government-as-a-platform as a technology-enabled government service innovation

ecosystem. More specifically, government-as-a-platform is a larger higher-level platform, that consists of several smaller connected platforms or micro-entities, which represent different industry-level platforms that form their own ecosystems. Together these entities form an open innovation ecosystem, in which both public and private sector actors can create innovative solutions for delivering public services in an improved way. A fundamental characteristic of the platform is that the citizen is in the center of everything. Furthermore, everything starts from the citizen's need, for which they get the best possible solution through the platform. For example, if the citizen is sick and wants to visit a doctor, they inform the platform about their need for example online, after which they are provided with several options to choose from, which can be sorted with different parameters such as time, place and price. Then, based on the provided options, the citizen can select the most suitable one for them, and visit the doctor as they wish. And the same goes for all public services. The government-as-a-platform model is depicted in Figure 4 below.

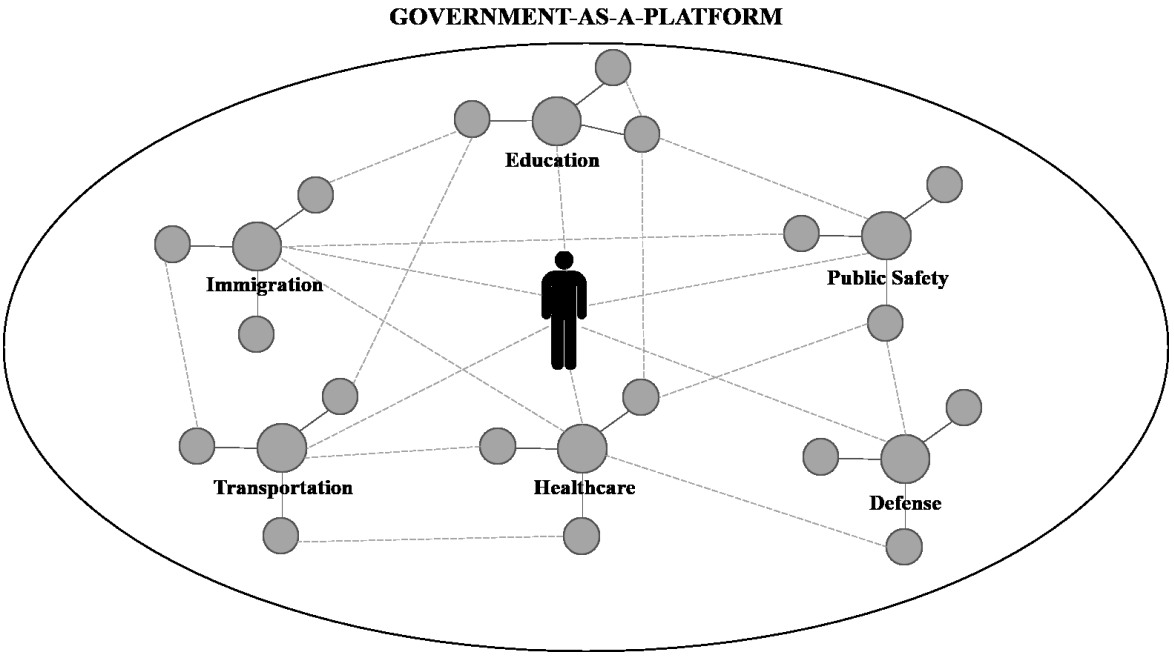

Figure 4. Government-as-a-platform[2]

Due to the broadness of the government-as-a-platform concept, it is impossible to explore the entire phenomenon in the limits of one study. Thus, I conducted an embedded single case study (Yin, 2003), where the focus was on one broader case context, healthcare-as-a-

[2] The platforms presented in the figure represent hypothetical industry-level platforms within the public sector.

platform, which represents a micro-entity within the broader government-as-a-platform context, and several embedded units of analysis within that context, namely several actors that represent different sides of the platform. The main benefit of this approach is that the subunits of analysis often increase opportunities for extensive analysis, and thus improve the insights about the case (Yin, 2003). Moreover, a single case study offers an opportunity to understand the studied phenomenon in depth and comprehensively (Easton, 2010). Focusing on a single case also makes it possible to study details, such as links of specific actions to circumstances and situations (Hirsjärvi & Hurme, 2004). What is more, a single case study has been stated to be an appropriate design when the case in question represents a unique and revelatory case which has not been studied before. A single case study can also be used as a pilot case in a multiple-case study (Yin, 2003). This could be a possible avenue for further research as the aim is to get a more comprehensive understanding of the government-as-a-platform idea. Then the other single cases could be for example defense-as-a-platform, immigration-as-a-platform and transportation-as-a-platform, which represent potential industry platforms within the public sector, as illustrated in Figure 4 above.

In my research, the platform provider in the studied health-care-as-a-platform context was Oy Apotti Ab, which is an organization responsible for building a shared client and patient information and operations management system for social services and healthcare. Platform contributors included public social and healthcare providers (Hospital District of Helsinki and Uusimaa and municipalities), private health tech providers (health tech startups), national services (eg. KaPa, KanTa and KanSa) and customers/patients. As I studied a multi-sided market, all of these actors were also playing the role of platform users. The structure of the Apotti platform is summarized in Figure 5 below, which is a simplification based on empirical data. The figure was also used as an illustrative figure in the semi-structured interviews that were conducted as a part of this study.

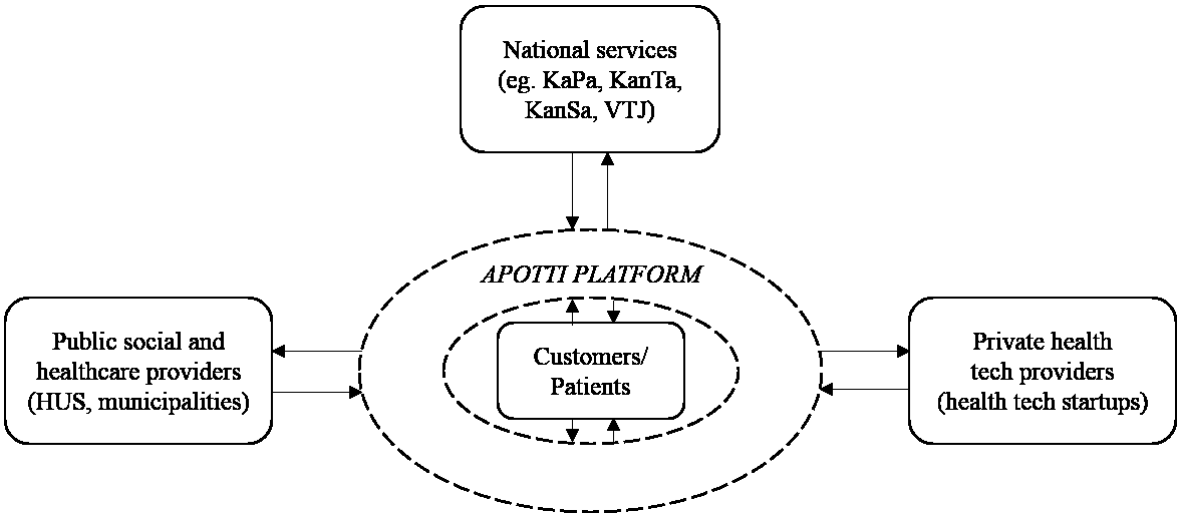

Figure 5. Apotti platform[3]

In my study, I focused on three units of analysis within the healthcare-as-a-platform context, namely the platform provider Oy Apotti Ab, public social and healthcare providers (HUS, municipalities) as well as private health tech providers (health tech startups). Furthermore, national services and customers/patients were not included in the scope of this study due to several reasons. First of all, the national services represent a different kind of contributor/user group to the Apotti platform compared to the social and healthcare providers and health tech startups, since they are not voluntarily involved with the platform, but mandated to provide their services by the law. Therefore, it is not useful to study the factors encouraging their contribution and participation. When it comes to the customers/patients, the reason why they were not included in the scope of this study is that unlike the other platform sides, they do not have the role of service provider in the platform, but rather their contributions to the platform are limited to submitting personal data, and thus their motivations to contribute would not be comparable to the others. Another reason for not studying the motivations of customers/patients is that the Apotti platform does not exist yet in practice, making it hard to study its usability from a users' point of view. Nevertheless, the customer/patient view should be studied in the future, to get a more comprehensive understanding of the motivations of different platform contributors and users. The embedded single case study design is summarized in Figure 6 below.

[3] The figure is a simplification based on empirical data.

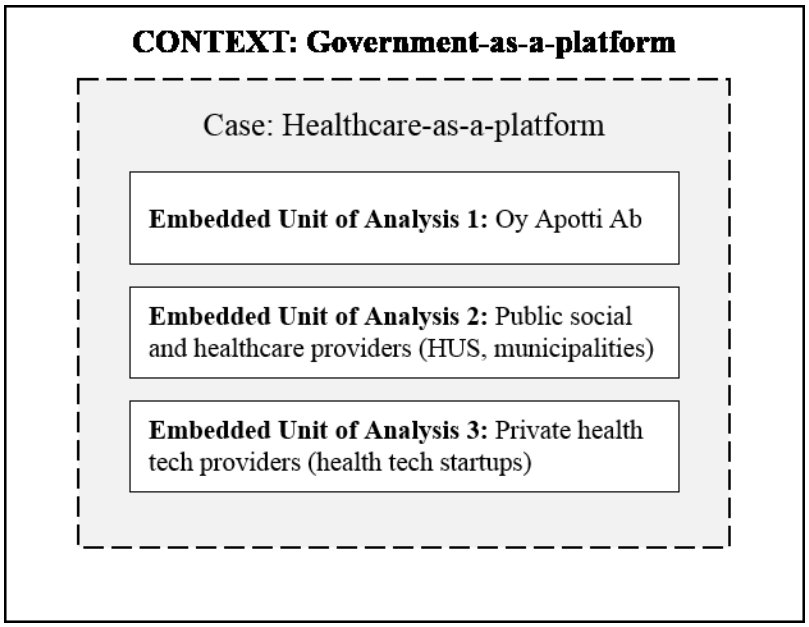

Figure 6. Embedded single case study design

Next, I describe the studied embedded units of analysis in more detail and justify their selection for the purpose of this study.

Oy Apotti Ab

Oy Apotti Ab is an organization that was established in 2013 by the municipalities of Helsinki, Vantaa, Kirkkonummi and Kauniainen and the the Hospital District of Helsinki and Uusimaa (HUS) to build a shared client and patient information and operations management system for social services and healthcare (Apotti, 2017a, 2017b). What makes Apotti an interesting case for my research is that the organization wants to build an ecosystem around the core Apotti system, through which different actors can develop complementary products and services. Furthermore, the organization officially started its ecosystem work in December 2016 and selected five first health tech startups to join the ecosystem (Apotti, 2017c).

In other words, Apotti acts as a platform leader, having close ties to a network of actors with a number of interdependencies, and by providing a base for others which is easy to build upon to create new innovative solutions. Thus, interviewees from Oy Apotti Ab provide insights from the platform provider's point of view. Finally, Apotti is essential for providing

some of the core public services, that is social and healthcare services, and thus is an excellent case to study the potential of the government-as-a-platform model.

Public social and healthcare providers (HUS, cities and municipalities)

The public social and healthcare providers, which in the case of Apotti include the Hospital District of Helsinki and Uusimaa (HUS), and the municipalities of Helsinki, Vantaa, Kirkkonummi and Kauniainen, are responsible for providing primary care and specialized medical care for residents in Uusimaa. Municipalities are mainly responsible for primary care in their health centers, while HUS takes care of the specialized medical care in the Uusimaa region (Choosehealthcare.fi, 2016; HUS, n.d.).

The reason why the public social and healthcare providers are an interesting unit of analysis for the purpose of my study is that they represent the main service providers, and thus platform contributors and users, in the Apotti ecosystem, providing a unique point of view to the research question. Moreover, the interviewees from these organizations provide insights from the public sector's point of view.

Private health tech providers (health tech startups)

Health tech startups are companies that are in early stages of their operations and focusing on health and wellbeing related technology products and services. The companies that participated in this study were identified from member lists of different health startup communities, such as HealthSPA (the Health Startup Association of Finland), GE Health Innovation Village and Vertical Accelerator.

Health tech startups were selected as a unit of analysis in this study, since they represent a different kind of group of platform contributors, thus providing another unique point of view to the research question. More specifically, interviewees from health tech startups represent the private sector point of view in this study.

3.2 Data collection

For the purpose of my study, empirical data was collected through semi-structured thematic interviews (Hirsjärvi & Hurme, 2004) with representatives of the different embedded units of analysis. The reason why the semi-structured thematic interview method was most appropriate for my study is that it is the best interview type for studying 'what' questions (Eriksson & Kovalainen, 2008). Furthermore, my research topic is relatively unfamiliar to many, as the concept of government-as-a-platform is rather novel. As such, there was a requirement for some level of explanation, making semi-structured interviews and a pre-prepared outline of topics, issues or themes the best data collection method. It ensured a consistent understanding of the concept by all research participants, while still maintaining flexibility (Hirsjärvi & Hurme, 2004). This on the other hand improved the reliability of the research.

Interview questions were formed based on existing literature, and grouped under different themes that were used to steer the conversation. Furthermore, an interview guide was used to ensure that all relevant themes were covered during the interview. The interview guide can be seen in Finnish in Appendix 1, and in English in Appendix 2. Even though an interview guide was used, the order of interview questions was kept flexible to maintain the conversational aspect of the interview and to allow asking additional, more precise questions. Overall, I followed a flexible data collection approach, which is a key feature in exploratory theory-building case study research. More specifically, this means that I started data analysis already during the data collection phase, as it allowed making adjustments for example to the interview questions during the process, and thereby taking advantage of emerging research opportunities (Eisenhardt, 1989). Indeed, flexibility, including the ability to adjust the order of the themes and to make clarifications, are one of the key benefits of the interview method (Hirsjärvi & Hurme, 2004).

In total nine semi-structured interviews were conducted in December 2016. The interviewees for the semi-structured interviews were recruited by contacting the target organizations and asking them to suggest suitable interviewee candidates. The selection criterion for the interviewees was that they have experience from development of social and healthcare services, to ensure that they have sufficient insights on the issue at hand. All except one interview were conducted in Finnish, since the semi-structured interview method is based

on use of language, and thus it is important that the researcher and the interviewee have a common language (Hirsjärvi & Hurme, 2004). Moreover, one interview was conducted in English, since the interviewee was not a Finnish-speaker. Overall, having a common language ensured that all definitions and meanings were better understood and less likely misconceived due to a language barrier. Furthermore, allowing interviewees to communicate in their native language made them feel more comfortable in the interview situation, and thus improved the interview quality.

The length of the interviews varied between approximately 30 to 80 minutes, and all of them were recorded and transcribed for analysis purposes with the permission of the interview participants. In addition, notes were taken during the interviews to record ongoing thoughts and ideas, which is seen as important in theory building research (Eisenhardt, 1989). All interviews were conducted face-to-face at the interviewees' offices. The interviewees were promised anonymity, and therefore their remarks and comments will be presented anonymously in this thesis, using specific codes which are listed in Table 5 below.

Table 5. Codes of interview participants

Interviewee	**Position**	**Organization type**	**Code**
1	CEO	Startup	Startup 1
2	CEO	Startup	Startup 2
3	Senior Adviser	Startup	Startup 3
4	CEO	Startup	Startup 4
5	CTO	Startup	Startup 5
6	Program Manager	Public sector organization	Public sector organization 1
7	Division Director	Public sector organization	Public sector organization 2
8	Senior Executive	Platform provider	Platform provider 1
9	Senior Executive	Platform provider	Platform provider 2

As the interviews were conducted in Finnish, I have translated the comments to English as accurately as possible. Still, it should be noted that some loss of meaning might have occurred in the translation and interpretation process. In addition to translating the quotes, I

have also clarified them by modifying the sentence structures and removing unnecessary words to make them more understandable. What is more, the accuracy of the quotes was checked with the interview participants, and therefore the reliability of the quotes is ensured. More specific interview details can be found in Appendix 3.

3.3 Data analysis

My data analysis process followed a typical analysis process of interview data. The process started with transcription, continued with categorization and coding, followed by comparison and combination and finally ended with synthesis, including interpretation and theoretical conceptualization of the findings (Hirsjärvi & Hurme, 2004). Next, I will explain the process and its phases in more detail.

After the interviews, I transcribed them manually, after which I started a more systematic analysis by coding each interview according to themes. I used the thematic analysis method for my study, since it is appropriate when conducting thematic semi-structured interviews. Thematic analysis allows identifying common patterns and themes from the data which then can be structured in a logical way with appropriate coding (Hirsjärvi & Hurme, 2004). More detailed information on the themes can be found in Appendix 4.

More specifically, I followed a modified version of Eisenhardt's (1989) case study analysis process to analyze my research data. I started my data analysis by analyzing each interview individually to identify the unique views of each interviewee before generalizing them. The reason for this is that having a deep understanding of each interview as a stand-alone entity made cross-interview comparison more efficient. Once I had completed the within-interview analysis phase, I moved on to cross-interview analysis to identify similarities and differences between interviewees representing the same embedded unit of analysis. These were found by using different tactics, such as comparing interview findings with a certain category or dimension. After having a comprehensive view of each embedded unit of analysis, I moved to the final level of analysis, where the target was to find similarities and differences between the different embedded units of analysis by comparing the findings of the cross-interview analysis phase. Overall, the aim of cross-unit analysis was to look at the case from different perspectives to improve the accuracy and reliability of emerging theory (Eisenhardt, 1989).

Next, having completed analyses both within and cross embedded units of analysis, I continued by shaping my hypotheses as more relevant and valid by measuring constructs and verifying relationships between them similarly as in hypothesis-testing research, as suggested by Eisenhardt (1989). Another important task that I completed after the initial analyses was comparing my research findings with existing literature. This included identifying similar and contradicting literature, which has been stated to improve the internal validity, generalizability and conceptual level of the findings. According to Eisenhardt (1989) this is especially important in theory building research, since the findings are based on a very limited number of cases. Finally, I ended the analysis process by synthesizing the findings into interpretations and a theoretical conceptualization of the studied phenomenon.

3.4 Research evaluation

Traditionally, research is evaluated by looking at the quality and trustworthiness of the research (Eriksson & Kovalainen, 2008). However, this should not be done only at the end of the study, but rather throughout the research process (Eriksson & Kovalainen, 2008; Hirsjärvi & Hurme, 2004). For example, making a good interview guide and transcribing the interviews as soon as possible are ways to improve the quality of research (Eriksson & Kovalainen, 2008).

When it comes to trustworthiness of the research, the concepts of reliability and validity are often discussed (Hirsjärvi & Hurme, 2004). Furthermore, these can be divided into four tests that are commonly used to evaluate the quality of any empirical social research, which are also relevant for case study research (Yin, 2003). First, *reliability* means that the study can be repeated with same results by the same investigator, when studying the same unit of analysis (Hirsjärvi & Hurme, 2004; Yin, 2003). Thus, it can be argued that my study is reliable, since I have explained my research methodology in detail, and thus I could replicate the study. Still, it should be taken into consideration that the results might differ even if the study was replicated, since the opinions of the interviewees may be time-specific. Second, *construct validity* means developing appropriate operational measures for the studied concepts, that is studying the concept with measures that have been proven to reflect the studied phenomenon (Hirsjärvi & Hurme, 2004; Yin, 2003). As I used a theoretical framework which was based on existing research on platforms and motivations as the basis of my study, it can be argued that the validity of the constructs that I used is good. Third,

internal validity means establishing a causal relationship, and thus is not applicable to exploratory studies and my research. Finally, *external validity* means establishing the context in which the research findings are generalizable (Hirsjärvi & Hurme, 2004; Yin, 2003). The external validity of my research findings is rather good, since they are mostly supported by previous research findings on similar, but still different contexts. Thus, it could be argued that my research findings could be applied to another context, at least to some extent. Nevertheless, it should be noted that the sample size in my research was rather limited, making the results less generalizable.

According to Eriksson and Kovalainen (2008), common ways to establish validity are analytic induction, triangulation and member check. Analytic induction means systematic development of causal explanations for different phenomena in a flexible and iterative way. Overall, the case study methodology is inductive in nature (Eisenhardt, 1989), and thus my study was also conducted using analytic induction. Furthermore, as explained earlier, I had a flexible data collection and analysis approach, which made it possible to iteratively develop and validate theoretical conceptualizations from the findings. Triangulation on the other hand means the use of multiple perspectives to refine and clarify findings (Eriksson & Kovalainen, 2008). I have used evidence from multiple empirical sources to cross-check information, as well as several theories to explain, understand and interpret the studied case, meaning that triangulation of data and theories are both present in my research. Still, triangulation could have been further improved by using additional data collection methods. Finally, member check is a procedure in which the researcher gives their interpretations back to the research participants for checking (Eriksson & Kovalainen, 2008). As mentioned earlier, in my research member check was done to validate my interpretations of the research findings, which further enhances the validity and reliability of my research.

Besides quality and trustworthiness, generalizability is a third concept that is often used to evaluate research. In practice, generalizability measures whether the research findings can be extended in some way into a wider context, which in qualitative research means a properly justified selection of research cases (Eriksson & Kovalainen, 2008). I have appropriately justified the selection of units of analysis, which belong to a wider context. Still, as I am only focusing on a single case or phenomenon within a broader system, the generalizability of the findings is somewhat limited. Indeed, single case studies are often criticized for their

lack of generalizability, which is why it is important to understand, that the goal of case studies is to expand and generalize theories rather than reach statistical generalization (Yin, 1989 cited in Easton, 2010:126).

In addition to these tests, Eisenhardt (1989) has outlined several appropriate criteria to evaluate theory-building case study research. First of all, one should assess, whether the study yields "good theory", that is parsimonious, testable and logically coherent theory, at the end of the study. The theoretical framework developed based on the findings of my study fulfill these criteria, as it is testable and logically coherent, and introduces new viewpoints to the studied phenomenon by synthesizing existing literature. Still, the theoretical framework should be tested in further studies to improve its validity and reliability. Second, one should evaluate how strong the research method and the evidence grounding the theory are. I have thoroughly reported my research method, sample as well as data collection procedures and analysis, and properly justified their use with existing literature. The main elements of the theoretical framework are also supported by empirical evidence. Nevertheless, the evidence is limited to only nine semi-structured interviews, and thus a broader set of interviews would make the research method and evidence stronger. Third, perhaps the most important evaluation criteria for theory-building research is whether it results in new, even groundbreaking insights. The government-as-a-platform phenomenon has not been studied in academic literature before and platform-related studies focusing on the public sector or government context are also rather limited. Thus, the results of this study provide new insights on the application of platform thinking in a government context.

Finally, it is important to consider the ethical issues of research when evaluating it, since they have an important role in how we create and perceive knowledge, as they affect the entire research process. A key guiding principle for any researcher should be to treat other people, including other researchers and research participants with respect. This means that others' work should be cited and quoted properly, and they should be given credit when entitled to it. Respecting research participants on the other hand means ensuring informed consent of interviewees and making sure that they are not harmed in any way by the research. This then again can be ensured for example by treating responses as confidential and granting anonymity to interviewees (Eriksson & Kovalainen, 2008). Consequently, it can be argued that I have conducted my study in an ethical manner, as I have cited and quoted others' work

properly, and ensured informed consent of interviewees. What is more, I have promised anonymity to the interviewees, and presented their comments and remarks accordingly, further improving the ethicality of my study.

4 FINDINGS

In this chapter, I present the findings of my research. First, I introduce the views of the interview participants on the state of digitalizing public services in Finland, and continue by presenting their views on the government-as-a-platform model. Next, I present the factors that encourage the platform provider to create a platform ecosystem, as well as the mechanisms they use to attract participants to the platform ecosystem. Finally, I outline the factors that encourage platform contributors, namely health tech startups and public sector organizations, to contribute to the platform ecosystem. The chapter is structured into separate sub-chapters to ensure clarity and logic. To support my findings, I use quotes extracted from the transcribed interviews.

4.1 Towards a platform economy

This section presents the views of Finnish public and private sector actors on digitalization of public services and the potential of the government-as-a-platform model in Finland.

4.1.1 Digitalization of public services

Most interview participants agreed that digitalization of public services in Finland is only beginning, or that it is still in a very early phase. For example, two participants mentioned that 'there is still a lot of work to do', while a third one stated that in their opinion there is more discussion on digitalization than concrete actions and visible results.

The interview participants gave several explanations for the early development stage. One reason that was mentioned by two participants was that in their view there are several digitalization initiatives going on, but the problem is that different organizations are working too much on their own, rather than engaging in collaboration. Moreover, three representatives of startup companies noted that the public sector could be more open and flexible to new solutions and ideas.

> *"I think all hospital districts are working too much on their own, so there should be more collaboration...I think that if we are talking about public service development, it is pointless that hospitals are doing some in-house development...They should take companies with them to develop the services, since like that we would get some return*

for our tax money at some point...So somehow I would want to see more opportunities where startups are involved in development, and that their thoughts would be listened." (Startup 1)

Another factor that was seen to restrict digital development was a prevailing negative atmosphere towards new innovations, which was mentioned by three participants. Furthermore, they explained that it seems that there are more people thinking about why digitalization cannot happen or seeking barriers to it, rather than looking for opportunities and enabling factors.

"There are more people who say why this cannot be done than people who would think that how this should be in 20 years when it should be working. When we build to the future, we talk about today's technical issues or legislative challenges, so only very few people look into the future in my opinion." (Startup 2)

"There is this lack of faith and courage. People are afraid of failure...and with this kind of attitude nothing moves forward." (Startup 3)

Additionally, one participant mentioned that a lack of risk-taking ability in the public sector is one factor that is supporting the negative atmosphere, and preventing innovations.

"In the public sector there is no such compulsion [to succeed], the government always comes and helps...and this then again leads to the fact that there is no risk-taking ability to do experiments...and if we now talk about innovation, I don't see any innovation in that, or if there is no possibility to fail, it is clear that innovations won't be created either." (Startup 2)

A third factor that was highlighted by three participants was that digitalization is understood and discussed in different ways by different actors, and that currently there is a lack of common understanding on the issue. More specifically, two participants argued that there is a lack of leadership with respect to digitalization in the public sector.

"Some kind of leadership is missing...that someone would come and say that this is how we do it now, end of discussion. Here is some money for you, this is how we do it now. That is missing. There is no overall view." (Startup 3)

In addition, two participants pointed out that thus far most public sector development projects have focused on building the supporting infrastructure and conditions for digitalization, speculating that this might be the reason why digitalizing public services is currently in such an early stage.

Finally, two participants highlighted that digitalization is not only about developing IT, but something more.

"Something that is related to digitalization is that it is not accomplished with IT, but with operational changes." (Public sector organization 2)

"If we just renew the system, get rid of the old legacy and get a new system - that's not digitalization yet." (Public sector organization 1)

4.1.2 Government-as-a-platform

Regardless of dealing with the current state of digitalizing public services in a rather pessimistic way, most interview participants were positive towards the government-as-a-platform idea, and saw potential in it. Furthermore, six out of nine participants stated that government-as-a-platform is the direction we should be or are going towards, two of them even stating that there are no other options.

"For sure we are going to this direction. The reason for that is that the public sector actors currently cannot provide, or don't have the resources to provide, services on their own. And then on the other hand there is also clearly a political tendency to open up the society." (Public sector organization 1)

"I think this is realistic, this [government-as-a-platform] will happen in any case, we cannot prevent that. So even if we did everything as foolishly as possible, still in

the worst case we can only postpone its realization with ten years...So as a development path this is unavoidable." (Platform provider 2)

Moreover, one participant noted that platforms are especially relevant now that the social and healthcare reform is taking place in Finland:

"Now that there is an agreement on freedom of choice in social care and healthcare, that requires something like this...like a service platform or platter from which the person can select...Somehow this needs to be solved and figured out." (Public sector organization 2)

Still, the participants listed some challenges that in their view might prevent government-as-a-platform from realizing. First of all, one participant mentioned, that too many abstract layers should not be constructed, but rather the focus should be on making practical level operations simpler, easier and faster. Another participant had a related view, stating that the biggest risk regarding the model is in finding the balance between a centralized administrative structure and an infrastructure enabling innovations. Second, a different challenge to the government-as-a-platform model brought up by another interview participant was that different industries within the public sector are in different development phases in terms of digitalization, which might make it difficult to connect them. Third, another participant emphasized, that a key challenge for implementing government-as-a-platform is finding and driving a common vision, and creating conditions that ensure that everyone is working towards the same goal. Indeed, one participant stated, that one of the key risks for the government-as-a-platform idea is that different industry ecosystems are not willing to cooperate, but rather compete against each other in jealousy. Fourth, three participants mentioned that some type of model for public-private collaboration should be established, one of them further emphasizing that the private sector should be given more opportunities in the public sector in order for government-as-a-platform to realize.

"I think that in order for this [government-as-a-platform] to work efficiently, the public sector needs to reduce control and drive privatization even more and in a way make it possible for private service providers to be public service providers." (Startup 1)

Fifth, one participant stated that the model is good only if it is a truly open and free system.

> *"Then if it is open so that I as a consumer and citizen can truly select the most optimal service for me, then I see this as a good thing. But if it goes so that we have these [options], but then there are three from which you can select, one provided by X, one provided by the government, and one provided by Y, then in my opinion it is not really the kind of freedom of choice that is in the citizen's control."* (Startup 5)

Finally, one participant was questioning whether there is a sufficient mass for government-as-a-platform in Finland in order for it to work efficiently, and concluded that the model might work at least in the capital region which is more populated than other parts of the country.

In general, interview participants had a positive attitude towards platform and ecosystem thinking in the public sector, and in the healthcare sector in particular. Furthermore, four participants explicitly stated that ecosystem thinking is good and needed, especially emphasizing the benefits of collaboration between public sector organizations and startups.

> *"We need to go towards that [ecosystem], since otherwise the entire system will die over time since it cannot innovate or develop on its own. Or it is a trend everywhere right now that you seek for that speed from the outside, and to stay up-to-date you need to collaborate with startups and small companies who can then move faster."* (Startup 5)

4.2 Factors encouraging platform contribution - the platform provider's perspective

This section presents the factors that encourage platform contribution from the platform provider's point of view. First, I will present the factors that encourage platform ecosystem creation. After this, I will outline the factors that the platform provider uses for encouraging platform contribution, which naturally are also factors that the platform sees as attractive for potential platform contributors.

4.2.1 Factors encouraging platform ecosystem creation

Both representatives of the platform provider organization agreed on two main factors that encourage them to create a platform ecosystem. First of all, they mentioned that the key driver for building the ecosystem is the opportunity to improve and diversify the service offering for both customers and patients as well as social care and healthcare professionals, and thus gaining operational efficiencies. Second, both interviewees reported that an important reason for creating an ecosystem is that they want to provide growth opportunities for startup companies, and like this drive greater societal benefits.

> *"This is a chance for Finnish health tech startups to get access to rather big clients and commercial opportunities, and through that there are also important societal benefits, since if the startups perform well, get a chance to grow and get new clients, that way we of course get more tax money to the society and like that general wellbeing improves."* (Platform provider 1)

> "*If a Finnish company gets a lot of money from abroad, hopefully they pay their taxes to Finland and then we save lives again with that money."* (Platform provider 2)

Moreover, the other representative elaborated that they want to create a market where public sector organizations can leverage the innovativeness, knowledge, drive and agility of startups as well as their ability to go to niche markets. Additionally, the other interviewee stated that one reason that encourages them to create an ecosystem is that they can learn what the startups do and get to know the people behind them.

Finally, the other representative implied that one reason encouraging ecosystem creation is the prevailing market trends that support platform-based models.

> *"Our experience along the years seems to signal that there is a lot of pressure for this [ecosystem], public discussion indicates that there is interest and need for this, and also some preliminary analyses that we made for a wide group of different parties, all of these seem to strengthen the same image...Or at least different parties have a similar view of it. Of course people have a bit different expectations of what*

the operating models are, but an ecosystem as a broader concept seems to be self-explanatory." (Platform provider 2)

Summary of the findings

The following table summarizes the findings of this section.

Table 6. Factors encouraging platform ecosystem creation

Encouraging factor	**Mechanism**
Operational efficiency	• Improved service offering
Social contribution	• Providing growth opportunities for startups
Learning	• Learning and getting to know startups
Market trends	• Market pressure • Public discussion

4.2.2 Factors used for encouraging platform contribution

The representatives of the platform provider mentioned several factors that the platform uses to attract startups to join and contribute to the platform ecosystem. These factors are outlined in the following sub-sections.

Flexibility and openness

The other representative of the platform provider described that one of the key things in building the ecosystem is identifying the factors that attract startups to join it, and mentioned that they have actively asked for and listened to startups' views on the matter for example by organizing a seminar for them. Moreover, both representatives stated that in principle, the platform has an open approach towards the ecosystem work, and a willingness to adjust the platform according to potential contributors' needs, and therefore to learn.

"We are iteratively increasing communication, so we have started from the fact that since our world is not ready, instead of sort of burying the final message in a chamber, we have taken an approach that hey, we want to do something like this, but we don't know how it will take shape, we could iterate with you [startups]…tell us

what you need. So already now there is a chance to influence how this ecosystem will become." (Platform provider 2)

In addition, the other interviewee mentioned, that once the platform demonstrates openness and flexibility, and that it is collaborating with startups, it hopes to transmit a positive signal to new potential contributors, attracting them to join.

Besides openness and flexibility, both interviewees told that communication is important for encouraging different actors to join and contribute to the platform. Furthermore, they mentioned that the platform is using different channels and means for communicating about the ecosystem for potential contributors, including the platform's public website, targeted e-mails and social media, as well as a separate site that contains technical information.

Concreteness

The other representative of the platform provider described that to make the ecosystem work, it is important to make it interesting for potential participants, and to make it stand out.

"It is important to profile the ecosystem since there are quite many ecosystems out there. Also it is important to take into consideration in this ecosystem work that startups select what is interesting to them and where they use their time, and thus our aim is to build an ecosystem that is functional, fast, clear and different." (Platform provider 1)

Furthermore, the representatives explained that they are trying to attract startups to join the ecosystem by adopting a startup-minded way of working, which is characterized by fast experiments, since startups are looking for concrete benefits and action rather than networking and discussions.

"Above all, startups are interested in that we start doing things and not talk about doing things. So if the core of building this kind of ecosystem or being in the ecosystem is networking and discussions without concrete actions, the actors start to question how much time they can sacrifice to this if they cannot get any cash flow out of this." (Platform provider 2)

Business opportunities

Both representatives of the platform organization emphasized that one of the main things they think that attracts startups to join the platform ecosystem is access to broader business opportunities. Moreover, they explained that joining the platform is an excellent opportunity for startups to get access to new markets and internationalization opportunities, industry-specific and technical information, and industry experts' coaching.

> *"Market access is one thing, and another one is access to industry logic. Or there is this interesting thing that if you don't know how for example the operating room works, you cannot really read that from a book...so that you get to discuss with industry experts or listen to their unfulfilled needs is one example of what we aim to build...so at its best we would create this kind of business incubator type of concept for idea development"* (Platform provider 2)

More specifically, the other interviewee mentioned, that while they acknowledge that financing is extremely important for startups, it is rather difficult for the platform to act as an angel investor, so instead they aim to leverage a cash injection type of model to finance sparring and ideation for selected startups and to help them out. In addition, they mentioned that they try to make joining the platform ecosystem as cost neutral as possible for the startups to make it easier for them to join.

> *"We try to make it [joining] as cost neutral as possible so that we are not creating an earnings logic out of it for ourselves that a startup would pay us to get access, but rather try to lower the threshold as flexibly as possible."* (Platform provider 2)

Social capital

The other representative of the platform provider stated that one way that they see as attracting potential contributors to the platform ecosystem is the collaboration opportunities, networks and knowledge sharing that the ecosystem provides. Moreover, they stated that these factors indeed are one of the main reasons why so many ecosystems exist these days.

"One reason why there are so many of these ecosystems and business incubators is that the companies get this kind of place where they can seek for contacts, partners, ideas and peer support." (Platform provider 2)

Summary of the findings

The following table summarizes the findings of this section.

Table 7. Factors used for encouraging platform contribution

Encouraging factor	**Mechanism**
Flexibility and openness	• Listening to startups' ideas and opinions • Communication through different channels and events
Concreteness	• Focus on action through fast experiments, rather than networking and discussions
Business opportunities	• Market access • Access to information • Access to industry experts • Coaching • Financing/sponsoring
Social capital	• Contacts, networks, partners, peer support

4.3 Factors encouraging platform contribution of startups

Representatives of health tech startups described several factors that would encourage them to join and contribute to a platform ecosystem. These factors are presented in the following sub-sections.

4.3.1 Convenience

Four out of five startup representatives mentioned ease of use, particularly from a technical point of view, as an important factor influencing their participation in a platform ecosystem. Furthermore, three participants expressed that lack of bureaucracy and uncomplicated processes are important.

"I think it is important that the platform provides some kind of API or some kind of interface which is very easy and simple to understand without any troubles...And even better if the system also provides some kind of toolbox...that makes it even more convenient." (Startup 4)

"Technical ease is one thing, and then ease in terms of processes...so that there is as little as possible of this kind of process hassle like all kinds of agreements and papers and audits and all such things." (Startup 5)

"Technology should not be a barrier...it should be an enabler." (Startup 2)

More specifically, two participants implied that fast processes, concrete action and the feeling that "things are progressing" are key drivers for startups.

"Agility is maybe the right word, so if it is a project that lasts six months or a year, we aren't that interested. Or then the business value needs to be so good that it interests us. So it's kind of like this ease and lack of bureaucracy. Of course when we talk about healthcare there is always some [bureaucracy], but it should be reduced to a level that it would be sort of encouraging to start investigating it [the platform] and using time to integrate to it." (Startup 5)

"If there is an opportunity somewhere else to move forward faster, it is much more interesting than if for example decision-making is too slow here...or the feeling that things proceed creates some kind of meaning to it, that this is actually wanted." (Startup 2)

Consequently, fast experiments, or the possibility to experiment, were seen as a good model to encourage startups to join, since they require shorter commitment decreasing the risks for startups. Overall, experiments were mentioned by four out of five startup representatives, while two participants explicitly stated that the platform is more attractive if it is able to decrease the ambiguity and risks for the startups.

4.3.2 Transparency

All startup representatives stated that openness is an important characteristic for the platform. Furthermore, two of them emphasized that to encourage startups to join and contribute to the platform ecosystem, the platform should communicate as transparently as possible. Moreover, one of the interviewees explained that it is good if the platform is open to startups and their ideas early on in the development process, since it improves transparency.

In general, communication was seen as an important factor, since if the platform does not communicate about its existence and the opportunities to contribute, it is hard to join it. What is more, one interviewee described that communication is also important in ensuring that all platform participants are working towards the same goal.

> *"Communication is very important. Usually it goes so that there is a lot of talking and the concepts remain unclear and they are misunderstood and therefore things cannot proceed and the vision is not presented so its really hard to pull the rope to one direction when everyone is kind of going into a different direction and driving their own agenda."* (Startup 2)

Finally, one participant also explained that trustworthiness of the platform and the information on it is important, as well as the robustness of the platform since they provide some kind of long-term security for the startups, and facilitate their decision to join the platform ecosystem.

4.3.3 Information

Different types of information regarding the platform was seen as a critical factor encouraging platform contribution. First of all, two participants stated that technical documentation is important, while supporting toolkits were seen as useful only by one interviewee.

> *"Interfaces and interface descriptions are enough and then a sandbox so that you can go and try it out."* (Startup 1)

"Documentation is always critical, but if REST interfaces are used, it doesn't require any toolkits or special development environments in my opinion." (Startup 5)

"I think that the supporting tools will help many startups and even big companies to join because it will lower the threshold." (Startup 4)

Second, three out of five startup representatives noted that in order for them to join the platform, it needs to have a clear target and operating model, and clear "rules of the game". Furthermore, one of the interviewees mentioned that it should be clear for the participants that how the platform ecosystem is managed or controlled and who is managing it.

In addition, three participants pointed out that the earnings logic of the platform needs to be clear, since in order for them to join, they need to know what and how they get out of it. Moreover, having an explicitly stated earnings logic was seen as risk-reducing for the startups.

"There need to be clear rules and an agreement on the earnings logic to reduce the risk that someone else collects the benefits when we open up our solution and data." (Startup 3)

"Let's say that we for example provide some information to the platform, so who is using that information and how does it benefit us financially, or this is not charity after all...so for us startups the biggest question often is that where does the money come from and how fast." (Startup 5)

Besides information on the platform itself, access to data was seen as interesting by two interviewees. More specifically, they mentioned that the platform should provide an opportunity for companies to access data, and to use it for their business purposes.

Finally, three out of five startup representatives mentioned that access to industry experts, or a possibility to discuss with them would be beneficial for startups, since understanding the industry logic is important in solution development. Indeed, industry knowledge was seen as a key requirement for being able to contribute to a healthcare platform.

4.3.4 Financing

Naturally, getting financing or sponsoring from the platform was seen as an attracting factor by the startup representatives. Three out of five representatives explained that financing influences significantly startups' decisions on whether or not to join a platform, since all money they can get is crucially important for their survival.

> *"If the platform wants startups to join, it facilitates [startups'] decision-making a lot if they are ready to sponsor the work."* (Startup 5)

> *"It [joining] needs to be possible financially."* (Startup 2)

Furthermore, one representative mentioned that not getting any sponsoring from the platform would actually discourage them from participating.

> *"We will not join if we need to pay everything by ourselves."* (Startup 2)

More specifically, they explained that in case there are no financing mechanisms that support innovation and experiments, it is really hard for startups to join the system, continuing that without investments, nothing can be created.

Finally, one of the interviewees pointed out that the importance of financing for startups is something that more established organizations should keep in mind in case they want to cooperate with startups.

> *"Financing is actually quite essential, because something that big players often forget is that for them the sums are insignificant, but for startups they are big sums. This should always be kept in mind when working with startups."* (Startup 5)

4.3.5 Business opportunities

Four out of five startup representatives mentioned that potential growth opportunities would attract them to join the platform ecosystem. Moreover, they explained that getting the opportunity to collaborate with some established industry players would be an excellent starting point for entering bigger, even international markets.

"The system provider [Epic] is a new actor in Finland and globally it is really big, so when startups get to work with them in Finland, it is so much easier to take one's product or service abroad when we can say that we know the system and have made integrations to it." (Startup 1)

What is more, two of the interviewees described, that joining the ecosystem would also be an opportunity to grow their reach in a way that their service would become more meaningful and impactful, as it would be available for more people.

Besides growth and internationalization opportunities, commercial and financial opportunities were stated to be important by all startup representatives. More specifically, they reported that as entrepreneurs, commercial and financial opportunities are always on their mind.

"If I'm completely honest, all motivations are financial in one way or another...in my opinion an entrepreneur who says that the financial side is not that important is lying." (Startup 1)

Furthermore, one participant mentioned that if they did not get any financial benefits from joining the platform, they would still expect to get something in return.

"If our solution was freely integrated to the system, then we would also want to have free access to other services in the system." (Startup 4)

4.3.6 Reputation and credibility

Three participants mentioned that getting a chance to work with bigger industry players in the platform ecosystem would be interesting to them, since they would get a chance to demonstrate their capabilities and consequently to improve the credibility of their company and solution. They explained that getting this kind of validation is important for being able to acquire new customers, enter new markets and get more financing, and thus to grow the company.

"HUS is a big and important player, and therefore an extremely good reference when going abroad." (Startup 3)

"It is this kind of validation and credibility for what we are doing. Or if we can say that in Finland we collaborate with HUS and other similar organizations, of course it is valuable." (Startup 5)

"It is an opportunity to demonstrate the viability of our solution. And that is important for scaling our product or service and to get more financing." (Startup 3)

Moreover, one of the participants pointed out that credibility and being able to provide clinical evidence is especially important in the healthcare industry, and elaborated that it would be good if the platform provided some kind of opportunity for startups to do so.

Similarly, getting publicity and company recognition through the platform ecosystem were seen as important by startup representatives. Furthermore, three of them mentioned that getting publicity and recognition for their company would further improve their credibility, and thus help them to grow.

4.3.7 Learning and reciprocity

Learning from others through collaboration was seen as a factor encouraging participation to the platform ecosystem by four out of five startup representatives. Furthermore, one of the interviewees explained that sharing examples, success stories and explaining the reasons behind failures are important, so that everyone does not need to start from the very beginning and "reinvent the wheel". More specifically, they described that communicating about others' examples could even encourage more participants to join the platform.

Indeed, knowledge sharing between platform participants was explicitly mentioned by three participants, who explained that it would be good if the platform provided some kind of mechanism or forum for sharing knowledge between different actors.

"One thing that could be good in this kind of platform is somehow sharing this intellectual capital so that everyone wouldn't need to start from the very beginning...that this knowledge and expertise could be shared." (Startup 2)

"*If this platform could also become a hub where multiple people from different backgrounds could join and contribute in different ways, that would be something...or that people would have more chances to educate each other and interact with each other."* (Startup 4)

Besides knowledge sharing, contacts and networks were seen as a valuable motivation to join the platform ecosystem. Furthermore, one of the interview participants explained that the ecosystem can create a sense of community for lonely entrepreneurs.

"It [the platform ecosystem] enables a sense of community for entrepreneurs, since entrepreneurs are anyway quite lonely people, so when you find friends with whom you can do some sparring it's good." (Startup 1)

4.3.8 Social contribution

All startup representatives mentioned that one motivation for them to join the platform ecosystem would be to be able to contribute to a greater societal cause, or to "do good". Moreover, they explained that in the healthcare sector this kind of motivation is quite natural, since in general the purpose of healthcare is to improve wellbeing of people. Still, some of the participants noted that this motivation is not necessarily related to the platform itself, but rather to their company's overall purpose or vision.

"The basic idea for our startup is that we want to do good and change the current situation." (Startup 4)

"Of course there are these kind of soft values as well, or that we would want that this type of information would be available to doctors...so if we forget about the commercial aspects, this is really an interesting area where we would be happy to be involved." (Startup 5)

"Of course when we are on the healthcare sector, you somehow get this good feeling when you can help people and bring them a better life." (Startup 1)

"Our motivation is that we can actually do something good and useful and meaningful." (Startup 2)

4.3.9 Summary of the findings

The following table summarizes the findings of this section.

Table 8. Factors encouraging platform contribution of startups

Encouraging factor	**Mechanism**
Convenience	• Ease of use, simplicity, convenience • Lack of bureaucracy • Short, fast, agile and uncomplicated processes • Decreased ambiguity and risks • Fast experiments
Transparency	• Communication • Openness • Trustworthiness and robustness
Information	• Documentation • Clear "rules of the game" • Clear earnings logic • Access to data • Access to industry experts
Financing	• Getting financing or sponsoring
Business opportunities	• Growth opportunities • Financial benefits
Reputation and credibility	• References • Validation, credibility • Publicity, recognition • Ability to demonstrate viability of solution
Learning and reciprocity	• Learning • Others' examples • Knowledge sharing • Contacts, networks, community
Social contribution	• Doing good

4.4 Factors encouraging platform contribution of public sector organizations

Representatives of the public sector organizations described several factors that encourage them to be part of the platform ecosystem. These factors are presented in the following sub-sections.

4.4.1 Operational efficiencies

Both representatives of the public sector organizations stated that the main driver for their participation in the platform ecosystem is the possibility to gain operational efficiencies through integrated systems and processes. For example, the other interviewee mentioned that the integrated platform could allow better people mobility across the different social and healthcare organizations in the area. Moreover, the interviewees explained that currently the social and healthcare systems are extremely fragmented, and different municipalities have different systems, processes and cultures, which complicate daily operations.

In addition, both interviewees mentioned that the current systems are quite old, and thus do not match with today's requirements. Consequently, the motivation for being part of the platform ecosystem is to get new and modern solutions that respond to the needs of customers and healthcare professionals. The other interviewee added, that the fact that the systems are so old and fragmented also makes their maintenance extremely costly, implying that cost savings in general are also one key motivation to take part in the platform ecosystem. In contrast, the other interviewee did not explicitly state that financial benefits or cost savings would be a key motivation for their organization to take part in the platform ecosystem, but rather implied that operational change, more efficient processes and resulting increased impact and increased returns are important for them.

4.4.2 Convenience

Besides operational efficiencies, convenience was seen as one of the main benefits of the platform ecosystem by both representatives of the public sector organizations. The other interviewee explained that to them the fact that the core of the platform is built from an existing product that is then configured to match national and regional requirements is a very good approach, since then they do not have to build the basic system from scratch on their own. Moreover, they elaborated that this way is more efficient. Additionally, the other public sector representative explained that one reason why they feel that the platform ecosystem is

beneficial is that they can get new functionalities to use in a faster and more flexible and agile way.

Furthermore, they explained that this kind of technical flexibility is very important, since different public sector organizations have different needs in terms of what kind of functionalities they need, and thus it is good that they can modify the set of available functionalities according to their needs. For example, the Hospital District of Helsinki and Uusimaa (HUS), which is responsible for specialized medical care, needs some functionalities that support specialized care, which then again are useless for municipalities, who are responsible for primary care.

Besides technical convenience, one of the public sector representatives stated that for their organization, one factor that makes the platform attractive to join is that there is one centralized organization, that is the platform provider, who coordinates the platform in an agile and dynamic way. More specifically, they explained that this makes it easy for the municipalities to join the platform ecosystem. The representative also described that for their organization it is important that they only need to interact with one actor rather than many, which is why they think it is good that the platform provider acts as a coordinator.

4.4.3 Openness

Both representatives of the public sector organizations mentioned that one factor that makes the platform ecosystem attractive to them is its openness and flexibility, and the fact that it is built in collaboration by different actors. Furthermore, they felt that this kind of open operating model which allows different parties to join for example thanks to open APIs makes it possible to avoid so called vendor traps, which have thus far been quite common in the public sector.

> *"One reason why this needed to become an ecosystem is that there was also this kind of political alignment that if and when systems are developed, they need to have open interfaces and they need to be such that they will not become one vendor monoliths."*
> (Public sector organization 2)

4.4.4 Learning and reciprocity

The other public sector representative stated that learning and knowledge sharing are one factor that encourages them to be part of the platform ecosystem. More specifically, they explained that having the opportunity to work with a world class software vendor is something that their organization certainly will learn a lot from, while at the same time they have a chance to educate the vendor about the Finnish social and healthcare practices and systems. In other words, they viewed that the collaboration will be beneficial for all parties involved in the ecosystem in terms of learning and knowledge sharing.

4.4.5 Summary of the findings

The following table summarizes the findings of this section.

Table 9. Factors encouraging platform participation of public sector organizations

Encouraging factor	**Mechanism**
Operational efficiencies	• Harmonized, integrated systems and processes • New and modern solutions • Cost savings
Convenience	• Flexible and agile ways to get new functionalities • Offering that matches individual organizations' needs • Centralized organization acting as platform coordinator
Openness	• Open interfaces, collaboration of different actors • Avoiding vendor traps
Learning and reciprocity	• Learning and knowledge sharing

5 DISCUSSION AND ANALYSIS

In this chapter, I discuss and analyze the research findings in more detail, and compare them with existing literature. Moreover, I align and compare the views of representatives of the different platform sides, and based on them present a revised version of the theoretical framework. The analysis is presented in four parts: first, I discuss the application of platform thinking in the public sector, after which I move on to analyze the factors related to platform design and participant motivations, and finally, I introduce a revised version of the theoretical framework.

5.1 Platform thinking in the public sector

It has been stated that platforms represent the largest transformation since the Industrial Revolution (Accenture, 2016a; Kenney & Zysman, 2016), revolutionizing industry after another. However, until now, the platform revolution has transformed only a handful of industries, leaving some of the most important areas of our society, such as education, government and healthcare, still unaffected, meaning that the revolution in these sectors is only beginning (Parker et al., 2016). This view was also supported by the findings of this study, which revealed that in Finland, digitalization of the public sector is in a very early stage, and a lot of work still needs to be done to fully exploit the benefits of digital solutions. Furthermore, the results show that the main reason for such an early development stage is the lack of four things in the public sector: collaboration between organizations, a supporting atmosphere, a common understanding and leadership.

Nevertheless, regardless of a rather pessimistic attitude towards the current state of digitalization, most interview participants had a positive view about platform and ecosystem thinking in the public sector, and the government-as-a-platform idea. Moreover, they listed several benefits of leveraging platform ecosystems in the public sector, such as increased collaboration between the public and private sector, operational efficiencies and consequent better public services, demonstrating that there is potential for platforms in the public sector. Indeed, given the exceptional value creation potential of platforms, it has been suggested in existing literature, that applying the principles of platform thinking in the public sector through the idea of government-as-a-platform could be a revolutionary solution for improving public service delivery. Furthermore, government-as-a-platform could improve

efficiency, effectiveness and transparency of public services through better integration and increased collaboration between public and private sector organizations (Accenture, 2016b; Janssen & Estevez, 2013; Parker et al., 2016; Williams et al., 2015, 2016).

Still, industry experts have pointed out that regulatory and budgetary constraints among other things complicate the application of platform thinking in the government context (Parker et al., 2016; Williams et al., 2015), and that a radical transformation of people, processes and organizations is needed for government-as-a-platform to realize (Accenture, 2016b). Furthermore, it has been stated that in general, regardless of industry or context, platforms require new approaches to strategy and leadership, and organizations who want to leverage their full potential need to develop new competences and a new mindset to succeed (Gawer & Cusumano, 2008; Parker et al., 2016; Van Alstyne et al., 2016). These views were also supported by the research findings, which highlighted that even though government-as-a-platform has its benefits, there are several challenges that need to be overcome in order for it to come true. First of all, the prevailing negative atmosphere towards new innovations and digital solutions needs to change. This means that the government needs to give up some of its control and take the role of an ecosystem orchestrator and facilitator, as suggested by Jansson and Estevez (2013). This is also supported by Van Alstyne et al. (2016), who state that to move from pipelines (traditional, linear value chain models) to platforms, organizations need to shift from resource control to resource orchestration. This means that their core assets are no longer tangible and intangible assets such as real estate and IPR, but the community of actors participating in the platform ecosystem.

Second, the governmental processes and structures, and overall infrastructure need to be transformed so that they enable collaboration and innovation through platforms. Indeed, Van Alstyne et al. (2016) argue that in platform ecosystems the focus should shift from internal optimization to external interaction, meaning that instead of embracing dictating processes, the key task for organizations is to persuade participants to join their platform ecosystem, and facilitate their interactions. In other words, the governmental structures and processes should be such that collaboration between different actors both within and outside the government is possible. In addition to transforming processes and structures, government regulation should be updated to meet the new conditions of the increasingly digital world and to address both the challenges and opportunities of the rising platform economy, as

suggested by Parker et al. (2016). Furthermore, regulation should encourage innovation and enable exploiting the full potential of platforms, while simultaneously reducing the negative externalities related to them.

Finally, the results show that a common vision needs to be established and communicated to ensure that everyone works towards the same goal, meaning that strong leadership is also required. This supports previous research, which argues that to become a platform leader, both a compelling vision that is understood and embraced by platform complementors, and a strong management that can drive and encourage the implementation of the vision are needed (Cusumano & Gawer, 2002; Gawer & Cusumano, 2008, 2014; Hagel et al., 2008). Overall, it is important to understand that digitalization, including the adoption of platform-based models, is not only about IT, as mentioned by two interviewees, but it is about large-scale operational transformation.

5.2 Factors related to platform design

Based on the research findings, it is evident that platform design, including both boundary resources as well as architectural decisions, have an important role in encouraging platform participation. Moreover, several factors related to platform design were mentioned both as attraction mechanisms by the platform provider, as well as attracting factors by the platform contributors. These factors are discussed in more detail in the following sub-sections.

5.2.1 Openness

It has been stated that open platforms attract broader participation, and therefore accelerate growth through innovation (Parker & Van Alstyne, 2008). Furthermore, modular architectures, which are composed of independently designed units that function as an integrated whole, have been found to encourage complementors to contribute to the platform, especially when interfaces are open (Cusumano & Gawer, 2002). These observations are also supported by the findings of this study, as all interview participants mentioned platform openness as an important factor encouraging platform participation. Platform openness, modularity, and open interfaces were seen as especially important by representatives of public sector organizations, who explained that they make it possible to avoid one vendor monoliths, and instead provide opportunities for different actors to join platform development activities. Representatives of the platform provider also stated that

openness and flexibility especially in terms of adaptability is a key way for them to attract participants, further supporting the importance of platform openness. This view was supported by health tech startup representatives, who implied that that the fact that the platform is open to startups' contributions and their ideas encourages them to join. Moreover, they explained that openness is one factor influencing the convenience and ease of joining the platform, and thus important.

Related to openness, communication was seen as another important factor encouraging platform participation. Both representatives of health tech startups and the platform provider stated that communicating transparently through different channels is important for attracting participants, since it is difficult to join the platform if potential contributors do not know about it. This is supported by Cusumano and Gawer (2002) who state that disclosure of information is the best way to support complementary innovation. Clear communication of the platform vision was also mentioned, as it ensures that all participants are working towards the same goal. Indeed, it has been pointed out that platform leaders need to have a compelling and clear vision that is understood by complementors, in order to get them join to create an ecosystem together and move to a particular direction (Cusumano & Gawer, 2002; Gawer & Cusumano, 2008, 2014).

5.2.2 Convenience

Besides factors related to openness, convenience-related factors were brought up by several interview participants. Moreover, ease of use, especially from a technical point of view was mentioned by four out of five health tech startup representatives, while ease in terms of processes that are fast and uncomplicated, or a lack of bureaucracy in general, was also seen as important. Convenience in terms of quick and easy access to the platform is also discussed in existing platform literature as a critical factor for encouraging platform participation. It has been stated that platforms can lower the barriers to usage for example by integrating essential tools and functionalities to the platform (Parker et al., 2016). Specific tools and functionalities were explicitly mentioned only by one interview participant as supporting platform participation, while two other interviewees said that they are not that relevant or necessary. Consequently, it could be speculated that tools and functionalities are not that critical in encouraging platform contribution, but they may have a positive impact. As clear

conclusions on this cannot be made based on the empirical evidence of this study, more research is needed to gain a better understanding.

Interestingly, startup representatives explained that for them one key driver for joining a platform ecosystem is concrete action, for example in the form of short experiments, since they are an easy way to join and see how things work out. Concrete action through fast experiments was also mentioned by representatives of the platform provider as a way to attract startups to join the platform. These findings provide a new viewpoint to the platform discussion, as previous studies have not reported concrete action and experimentation as factors encouraging platform contribution. Nevertheless, it should be noted that the findings might be related to the experimental nature of startup companies, and thus further studies which look at companies of different size should be conducted before broader generalizations can be made about the matter.

Similarly to startups, representatives of public sector organizations also pointed out that convenience is one of the main benefits that the platform ecosystem offers. Moreover, they explained that it allows them to get new functionalities faster, more flexibly and according to their organization's needs. More specifically, they mentioned that thanks to the platform ecosystem, they do not have to develop everything on their own, which makes development more efficient. Besides technical convenience, it was mentioned that the fact that the platform ecosystem is coordinated by one centralized organization makes it attractive for the public sector organizations, since they only need to interact with one actor, while still getting access to all the available functionalities and services. These views are also supported by existing platform literature, where it has been stated that some of the main benefits of platforms for different participants are the technological foundation they offer, the opportunity to customize functionalities as well as their ability to lower search and transaction costs. Furthermore, the platform provides a technological foundation of common elements, which allows participants to focus on developing the elements they are specialized in and to avoid unnecessary duplication of work, consequently saving development costs. Platforms also enable participants to get a customized set of products and services that matches their unique needs from a range of alternatives, while also lowering their search and transaction costs. Ultimately, these factors provide greater value for the participants, and thus attract them to the platform (Tiwana, 2014).

5.2.3 Information

Overall, information was seen as an important factor driving platform participation, especially among health tech startups. Health tech startup representatives highlighted that both information about the platform and access to data are important factors encouraging platform contribution. More specifically, they expressed that technical documentation, especially interface descriptions, is extremely important for them to be able to integrate their solutions to the platform. Another type of information that was seen as influencing platform participation significantly was information on how the platform ecosystem is managed and controlled, also referred to as "clear rules of the game". Similarly, having a clear earnings logic was stated to be crucial in terms of attracting startups to join the platform ecosystem, as it reduces the risk of participating and consequently lowers the threshold to join. In addition, access to data and industry experts were seen as interesting by several health tech startup representatives, as it would help them to improve their solutions, and thus provide better business opportunities. Surprisingly, providing an opportunity to get coaching and sparring from industry experts was also mentioned by the representatives of the platform provider as a mechanism to attract participants to the platform.

Information about the platform is also discussed in existing literature as a mechanism to attract participants to the platform. Furthermore, agreement on rights, earnings logic, open data, guidelines and documentation, which are known as cooperative boundary resources, that is contracts between the platform owner and complementors, have been stated to be crucial in encouraging complementary innovation (Ailisto et al., 2016; Boudreau & Hagiu, 2008; Ghazawneh & Henfridsson, 2013; Seppälä et al., 2015). More specifically, it has been stated that rules and procedures, defining the division of tasks, providing support and documentation, and sharing information among other things, are strategies that platforms use to manage ecosystems, further supporting the research findings. These boundary resources are used to minimize costs, complexity, uncertainty, asymmetric information and coordination problems, and therefore to encourage platform participation (Boudreau & Hagiu, 2008).

5.3 Factors related to participant motivations

Besides factors related to platform design, several motivational factors of platform participants were reported in the interviews. Factors related to both benefits that the platform offers as well as factors that drive platform participants' actions were mentioned. These factors are discussed in more detail in the following sub-sections.

5.3.1 Business opportunities

Interestingly, potential business and growth opportunities were seen as an important factor encouraging platform participation. Moreover, health tech startup representatives explained that getting a chance to work with established industry players would be a great opportunity for them to get access to international markets. They also explained that joining the ecosystem would make it possible for them to increase the reach and impact of their service. This view was supported by the representatives of the platform provider, who believed that market access is one of the main things that attracts startups to join the platform ecosystem. Market access is also discussed in existing platform literature as one of the main value propositions of platforms to complementors. Tiwana (2014) explains that the platform ecosystem may help the complementors to access potential customers and markets, that they could not have reached on their own, providing them a possibility to increase the demand of their product or service.

Besides market access for contributors, representatives of the platform provider mentioned that market access in terms of access to niche functionalities encourages them to create a platform ecosystem. The representatives of the public sector organizations had a similar view, stating that one of the benefits of the platform ecosystem for them is that they do not have to develop everything on their own. These views are also supported by existing platform literature, which describes that one of the main benefits of platform ecosystems is that it allows innovation on a wider scale and scope compared to traditional business models. Furthermore, instead of trying to innovate on its own, the platform owner can distribute innovation work to a large number of external contributors, and as a result get access to innovations it could have not developed on its own. This on the other hand enables the platform owner to focus on its core activities. What is more, the platform ecosystem strategy may help the platform owner to access niche markets, which it could not reach on its own, further supporting the research findings (Tiwana, 2014).

5.3.2 Financing

In existing platform literature, different types of subsidization strategies have been found to be effective in attracting participants to the platform. They are especially powerful in the early stages of platform ecosystem development as they create positive cross-side network effects and help to address the chicken-and-egg problem (Eisenmann, 2008; Evans, 2003; Gawer & Cusumano, 2008; Parker et al., 2016). It has been stated that in general, platforms should subsidize the most price sensitive side of the platform, and charge more from the side that derives higher value from the other platform participants (Eisenmann, 2008; Hagiu, 2014). In other words, platform leaders need to sacrifice some of their profits to encourage third-party innovation (Gawer, 2008). These findings were supported by the research findings, which revealed that getting financing and sponsoring significantly influence startups' ability and interest to join the platform ecosystem. Moreover, in the case of the studied platform, health tech startups represent the most price-sensitive participant group or side of the platform, while public sector organizations have larger financial resources, and thus it is natural that the platform provider tends to somehow subsidize the startups in order to get them to join the ecosystem. Indeed, the other representative of the platform provider explained that they try to make joining the platform ecosystem as cost neutral as possible for the startups, to make it easier for them to join.

5.3.3 Operational efficiencies

Representatives of the public sector organizations mentioned that one of the main benefits of the platform ecosystem is that it enables operational efficiencies in terms of improved systems and processes as well as cost savings. Furthermore, they explained that as the platform integrates, harmonizes and modernizes the currently fragmented and old systems and processes, operations will become more efficient and consequently costs will be saved. Indeed, in existing platform literature, it has been stated that platforms enable value creation through operational efficiency, scale economies and innovation. More specifically, adopting a platform ecosystem strategy allows achieving economies of scale and scope thanks to shared functionalities and decreased overlapping work (Tiwana, 2014). Moreover, according to Gawer (2014) systematic creation and harnessing of economies of scope in innovation through re-use of components can be seen as one of the fundamental principles of platform-based new product development. Overall, platforms increase productivity by efficiently matching different participant groups, supporting more efficient asset use, as well as accelerating innovation (Evans & Gawer, 2016). What is more, modular architectures of

platforms enable specialization, which drives further operational efficiency (Thomas et al., 2014).

5.3.4 Reputation and credibility

Enhancing reputation and gaining respect and credibility through recognition have been reported to motivate participation in collective innovation (Battistella & Nonino, 2012). This was also supported by the research findings, which revealed that publicity and company recognition, and consequently improved credibility, were seen as important by health tech startup representatives. Moreover, they explained that getting a chance to demonstrate their capabilities to established industry players through the platform ecosystem would be an excellent opportunity for them to improve the credibility of their company and solution, which again is important when acquiring new customers, entering new markets and seeking financing. In addition, they brought up that established industry players would be great reference clients for them, which could further support their growth.

5.3.5 Learning, reciprocity and social capital

Learning from other participants in the platform ecosystem and knowledge sharing were seen as important factors encouraging participation by most interview participants. First of all, the other representative of the platform provider explained that one reason that encourages them to create the platform ecosystem is that they can learn what the health tech startups are doing and the people behind them. Representatives of the health tech startups on the other hand described that one of the benefits of the platform ecosystem is that it allows learning through collaboration, exchange of examples and ideas, as well as gaining contacts and networks, providing a supporting community for entrepreneurs. Finally, the other representative of the public sector organizations stated that for them reciprocity in terms of establishing mutually beneficial exchange relationships is one factor encouraging them to participate in the platform ecosystem. Learning, reciprocity and social capital have also been listed as factors encouraging participation in collective innovation in existing academic literature (see Battistella & Nonino, 2012), supporting the findings of this study. Moreover, community-level learning has been stated to be one of the ways in which platforms enable value creation (Thomas et al, 2014).

5.3.6 Social contribution

Social motivations, including social responsibility and contribution to the greater good have been found to encourage participation in collective innovation (Battistella & Nonino, 2012). This was supported by the research findings, which revealed that both representatives of the health tech startups and the platform provider see "doing good" as one of their main motivations to participate in the platform ecosystem. Moreover, the representatives of the platform provider explained that one of their motivations to create the platform ecosystem is that by offering growth opportunities for startups, they can generate possible greater societal benefits, and consequently improve general wellbeing. Representatives of health tech startups on the other hand reported that for them participating in the platform ecosystem would be an opportunity to contribute to a greater societal cause, that is, improving wellbeing of people. Representatives of the public sector organizations did not mention any social motivations in the interviews, but the reason for this could be that for them it is self-evident that one of the main motivations for their actions is wanting to improve general wellbeing.

5.3.7 Other motivations

In addition to the motivations described above, in previous studies it has been discovered that entrepreneurial mindset, opportunity to express individual creativity, care for community, as well as enjoyment, fun and entertainment encourage participation in collective innovation (Battistella & Nonino, 2012). However, these factors were not mentioned by the interview participants of this study. The reason for this could be that the factors represent intrinsic individual-driven motivations, and thus were not considered by the interviewees, who approached the research question from an organizational point of view.

5.4 Revised theoretical framework

In the end of Chapter 2, I presented a theoretical framework that provides a comprehensive overview of factors that encourage platform participation. The framework was developed by reviewing existing literature relevant to the research focus of this thesis, and its appropriateness was tested by conducting nine semi-structured interviews. Furthermore, the purpose of the interviews was to discover, whether the framework requires some modifications.

The research findings mostly supported the initially proposed theoretical framework. Evidence of both factors related to platform design and participant motivations was collected, and therefore the elements of the original framework remained unchanged. Nevertheless, the research findings revealed several additional factors that influence platform participation that were not considered earlier, resulting in some modifications to the original framework.

First of all, it was discovered, that access to industry experts is one type of contractual boundary resource that can be used to attract participants to the platform ecosystem, and was therefore added to the revised framework. Second, factors related to platform benefits, including distributed innovation, market access, customization, lower search and transaction costs, operational efficiencies and cost savings, were found to encourage platform participation. Consequently, a third group of factors encouraging platform contribution, *platform benefits*, was added to the framework to make it more descriptive. Finally, the research findings demonstrated that a supporting infrastructure, which includes processes, organizational structures, regulation, leadership and a common vision needs to be in place to facilitate the existence and value creation of platforms. As a result, another additional layer, *supporting infrastructure* was added to the original framework. The revised theoretical framework is presented in Figure 7 below.

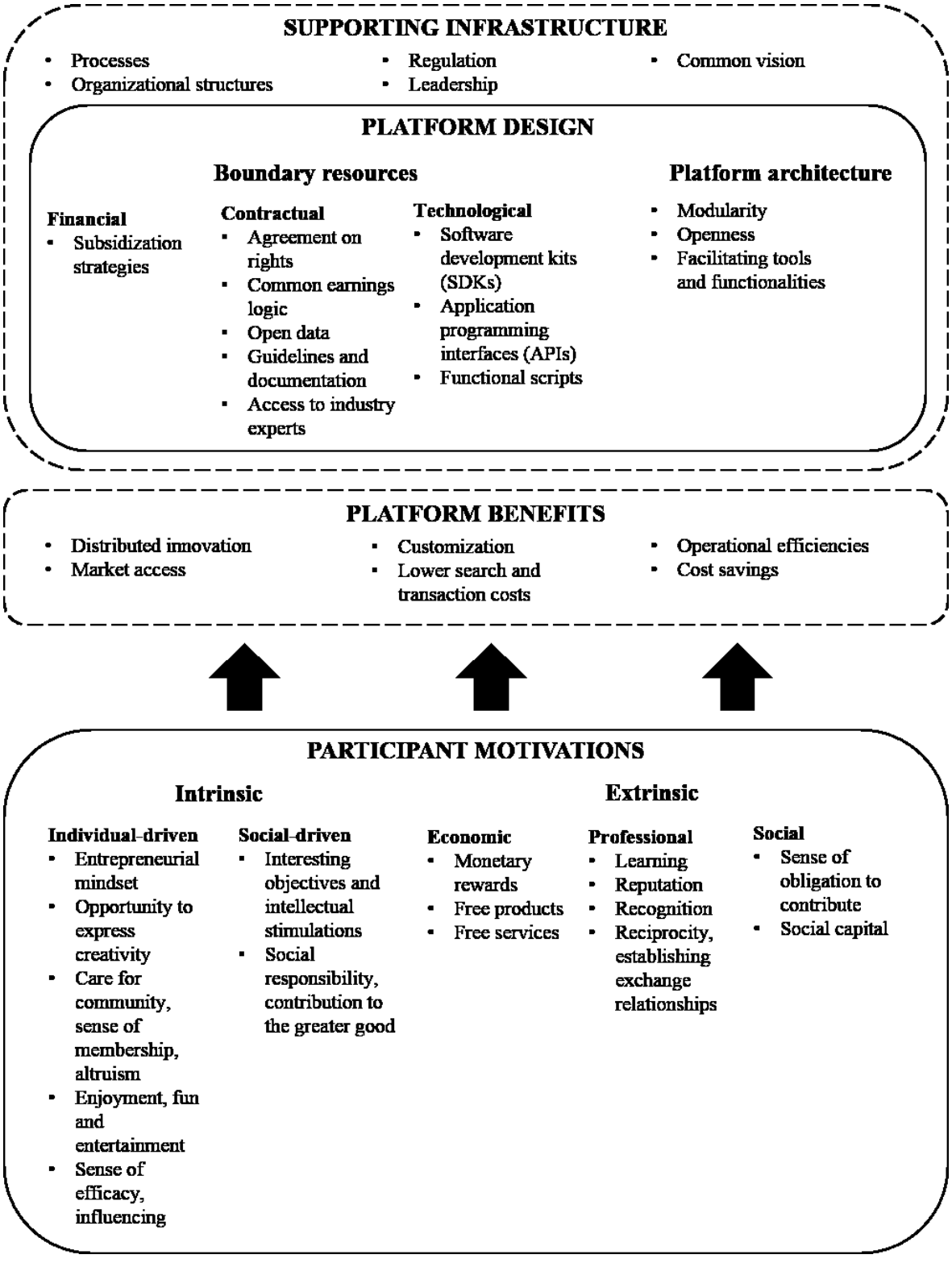

Figure 7. Revised theoretical framework

6 CONCLUSION

In this chapter, I present the main findings of my research and discuss their practical implications. Finally, I conclude by explaining the limitations of my study and suggesting some areas for future research.

6.1 Main findings

The purpose of this study was to discover how a government service innovation ecosystem, or government-as-a-platform, should be designed, so that different groups of actors, such as public and private sector organizations, would want to contribute to the platform, and generate innovative solutions for delivering public services in an improved way. Furthermore, the intent was to answer the following research question:

What are the factors that encourage Finnish public and private sector actors to contribute to a government service innovation ecosystem (government-as-a-platform)?

Based on the findings of this study, it is clear that both factors related to platform design and participant motivations encourage participants to join and contribute to a platform ecosystem, as outlined in existing platform literature. In addition, factors related to benefits provided by the platform were found to influence platform participation and contribution. In addition, a supporting infrastructure, including processes, organizational structures, regulation, leadership and a common vision needs to be in place to facilitate the existence and value creation of platforms.

More specifically, the research findings revealed that with respect to platform design, financial, contractual and technological boundary resources as well as platform modularity and openness are important for attracting participants to the platform. Overall, these mechanisms attract participants to the platform most efficiently when they make joining the ecosystem as convenient as possible. In terms of platform benefits, distributed innovation, market access, customization, lower search and transaction costs, operational efficiencies and cost savings were found to encourage participants to join the platform ecosystem. Furthermore, market access was seen as especially important by health tech startups, while operational efficiencies were emphasized by public sector organizations.

Finally, when it comes to participant motivations, both intrinsic and extrinsic motivations were discovered to influence platform contribution, in line with existing literature on motivations to participate in collective innovation. Especially social-driven intrinsic motivations, namely interesting objectives and contributing to the greater good, were reported to motivate participation in the studied platform ecosystem. In terms of extrinsic motivations, both economic and professional motivations as well as social motivations were found to influence platform participation. More specifically, monetary rewards, free services, learning, reputation, recognition, reciprocity and social capital were explained to encourage joining the platform ecosystem, especially from the health tech startups' point of view. Thus, it could be concluded that both factors related to the platform itself and the potential platform participants should be taken into consideration when building a platform ecosystem relying on complementary innovation.

In addition to answering the proposed research question, another objective of this study was to build conceptualizations on the government-as-a-platform idea that could potentially be used as a basis for further empirical studies, and to identify potential further avenues for research. The result of this study is a new theoretical framework that provides a comprehensive overview of factors that encourage platform participation, taking into account both factors related to the platform itself as well as the participants, which thus far have been studied separately. The presented framework is a useful contribution to the existing platform literature, as it provides a theoretical foundation that can be used in further studies in the field. In addition, a set of suggestions for further research were identified during the research process. These suggestions are introduced in the end of this chapter.

6.2 Practical implications

One of the most important challenges for platform leaders is attracting different actors to join their platform ecosystem and to contribute beneficial complementary innovations. The findings of this study provide several implications on how to attract different participants to join for organizations who are building or willing to create platform-based ecosystems. To begin with, the platform ecosystem should be designed so that joining is as easy and convenient as possible for potential contributors. This can be done by leveraging different types of financial and non-financial mechanisms as well as architectural decisions. First of all, the platform provider should attract more cost-sensitive actors to the platform by

subsidizing their participation to lower their threshold to join. Second, the platform rules and earnings logic should be clearly communicated to the potential contributors in addition to which technical documentation, including interface descriptions, should be openly available. Third, to further increase the attractiveness of the platform ecosystem, the platform provider should think how it could provide an easy access to data and industry experts for interested contributors. Finally, the platform ecosystem should be built around a modular and open architecture, to allow independent design of subsystems and consequently accelerated innovation.

In addition to platform design, platform leaders should also consider what the potential contributors are interested in or looking for in the platform ecosystem, and what motivates them to participate in it. Moreover, the platform provider should actively ask for and listen to the potential contributors' ideas and needs for example by creating some kind of forum for discussion. This type of forum could also be used for sharing knowledge between different ecosystem participants, and thus for enabling learning and increasing social capital. What is more, in order to attract potential contributors to the platform, the platform provider should actively communicate about the benefits of the platform ecosystem for them through different channels.

Overall, in order to achieve broad participation from third parties and to create value, the platform ecosystem should be open, flexible, evolvable, transparent and accessible. Furthermore, the platform leader should understand that it needs to sacrifice some of its profits and resist the temptation to create most of the value on its own, and instead create a space for others to innovate, since this creates positive network effects and provides increased value for all ecosystem participants.

6.3 Limitations of the study and suggestions for further research

The proposed theoretical framework provides a step forward in understanding the factors encouraging platform participation. Nevertheless, it has some limitations. First, as this study was a theory-building effort, the framework needs future empirical validation. More specifically, as the empirical part of this thesis was conducted as an embedded single case study with a limited interview sample, studying the government-as-a-platform idea with a multiple case approach and a larger sample would provide a more comprehensive view and

understanding of the topic. Furthermore, as mentioned in the methodology chapter, the different micro-entities within the broader government-as-a-platform context should be first studied in more detail, and after this compared and contrasted to achieve an integrated view of the phenomenon. Additionally, in future studies, the views of other platform sides that were not included in the scope of this study should be studied, to understand whether the factors that encourage them to join and contribute to the platform are similar or different compared to the other platform contributors. Studying the customers' point of view is especially important, since after all, they are the ultimate reason why the platform exists.

In addition to broadening the scope of research, other research methods besides qualitative semi-structured interviews could be used in future studies to gain deeper insights on the matter. For example, a multiple methods approach, such as a combination of quantitative and qualitative research methods could be used to improve triangulation of research evidence, as suggested by Eisenhardt (1989). What is more, as this study focused on the factors that encourage Finnish public and private sector actors to contribute to a government service innovation ecosystem, comparative data from other countries could be gathered and compared with the data from Finland to discover whether the encouraging factors differ across countries or not. Finally, it would be interesting to understand which factors are the most important for encouraging platform participation, as well as the factors that encourage participants to stay in the platform ecosystem, since not only attracting participants to join, but maintaining them on the platform is important for the platform's long-term success.

In other words, the proposed framework only offers a beginning for exploring drivers behind platform participation, and does not provide answers to several important questions. Nevertheless, these unanswered questions provide promising avenues for further research, which have the potential to improve our understanding of the rising platform economy.

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APPENDICES

APPENDIX 1: INTERVIEW GUIDE IN FINNISH

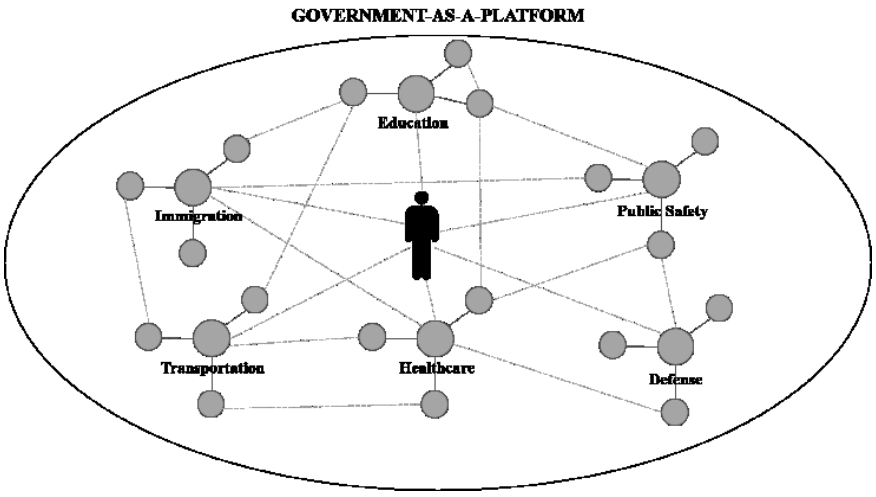
HAASTATTELURUNKO

PROFIILI
Voisitko kertoa lyhyesti itsestäsi ja organisaatiosta jossa työskentelet?

YHTEISET KYSYMYKSET

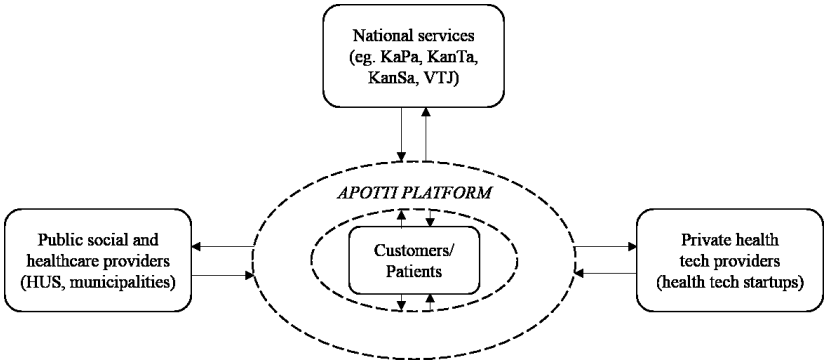
1. Mikä on näkemyksesi julkisten (terveys)palvelujen digitalisoinnin tilasta? Mitkä ovat mielestäsi palvelujen digitalisoinnin mahdollistajat/edistäjät? Entä haasteet/hidasteet?

Alustatalouden nousun myötä on esitetty ajatus siitä, että alustamallin (government-as-a-platform) hyödyntäminen voisi olla myös tulevaisuuden ratkaisu julkisten palvelujen digitalisaatiolle. Määritelmäni mukaan government-as-a-platform on suurempi ylätason alusta, jonka sisään mahtuu monia pienempiä alustoja/mikroyhteisöjä, jotka linkittyvät toisiinsa. Yhdessä nämä muodostavat avoimen innovaation alustan, jossa sekä julkisen että yksityisen sektorin toimijat voivat luoda uudenlaisia ratkaisuja esimerkiksi avointa dataa hyödyntäen.



2. Miltä tämä kuulostaa/ mitä ajatuksia alusta herättää? Näetkö tällaisen mallin mahdollisena Suomessa? Miksi/ miksi et? Mitä hyvää/huonoa näet mallissa?

Koska government-as-a-platform -malli on laaja käsite, jota on tutkittu hyvin vähän, sen ymmärtämiseksi tarvitaan useita tutkimuksia, jotka keskittyvät sen eri osiin. Omassa tutkimuksessani tarkoitukseni on keskittyä yhden mikroyhteisön tarkasteluun alustan sisällä ja ymmärtää tämän potentiaalia tarkemmin. Tutkimuskohteeni on healthcare-as-a-platform -mikroyhteisö ja sen eri osapuolet, eli julkisen sektorin organisaatio (Apotti) alustan tarjoajana, ja julkisen ja yksityisen sektorin organisaatiot alustan kontribuojina ja hyödyntäjinä.



3. Miltä tämä kuulostaa/ mitä ajatuksia alusta herättää? Näetkö tällaisen mallin mahdollisena Suomessa? Miksi/ miksi et? Mitä hyvää/ huonoa näet mallissa?

Jotta alusta voi toimia ja tuottaa arvoa, sille tarvitaan luonnollisesti osallistujia, minkä vuoksi eri toimijoiden motivaatioiden ymmärtäminen on tärkeää.

ALUSTAN TARJOAJA (APOTTI)

4. Mikä kannustaa tarjoamaan/luomaan alustan/ekosysteemin?

5. Miten pyritte houkuttelemaan muita osapuolia mukaan alustaan/ekosysteemiin? Miksi?

6. Miksi uskotte, että eri toimijat haluavat osallistua/kontribuoida alustaan/ekosysteemiin?

7. Miten viestitte alustan/ekosysteemin hyödyistä potentiaalisille kontribuoijille?

8. Minkä uskotte olevan paras keino houkutella muita toimijoita mukaan?

KONTRIBUOIJAT/ HYÖDYNTÄJÄT (HUS, KUNNAT, STARTUPS)

4. Mikä kannustaa osallistumaan/kontribuoimaan alustaan/ekosysteemiin? Mikä ei? Miksi?

5. Miten alusta/ekosysteemi tulisi suunnitella, jotta haluaisitte osallistua siihen? Miten ei?

6. Millä tavoin alustaan/ekosysteemiin voisi mielestänne kontribuoida? Mitä tämä edellyttää?

APPENDIX 2: INTERVIEW GUIDE IN ENGLISH

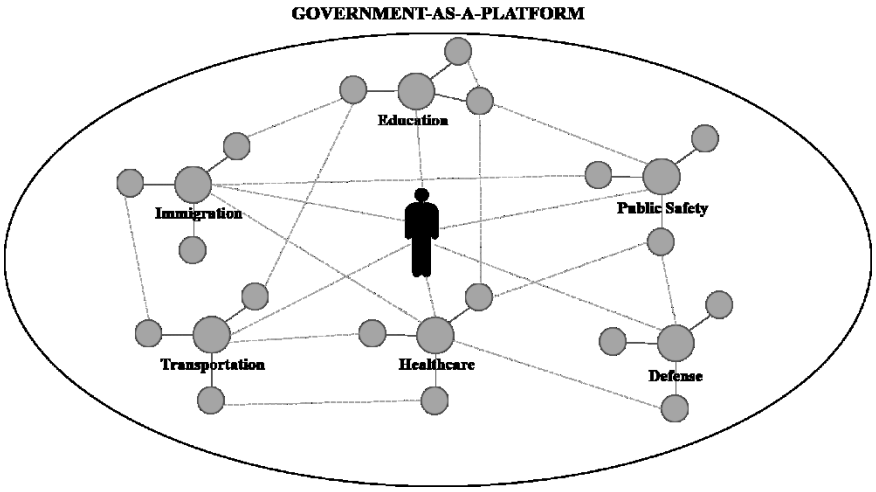
INTERVIEW GUIDE

PROFILE
Could you briefly tell about yourself and your organization?

COMMON QUESTIONS

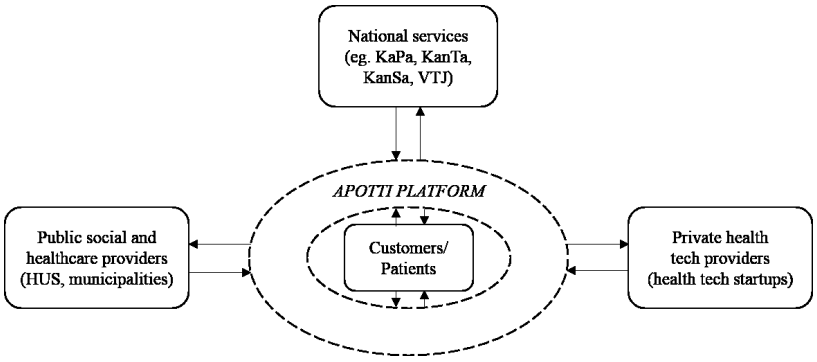
1. What is your view on the current status of digitalizing public (healthcare) services in Finland? What in your opinion are the key barriers/enablers?

It has been suggested that in the future one way to provide public services in a more efficient way could be a government-as-a-platform model, which I define as a larger higher level platform, that consists of several smaller connected platforms or micro-entities. Together these entities form an open innovation ecosystem, in which both public and private sector actors can create innovative solutions for delivering public services in an improved way, for example by leveraging open data.



2. How does this sound or how do you see this type of model? Do you see potential for this type of model in Finland in the future? Why/ why not? What good/bad do you see in this model?

Since government-as-a-platform is an extremely broad and underresearched topic, many studies that focus on its different parts are needed. The focus of my study is one micro-entity within the broader government-as-a-platform context, namely healthcare-as-a-platform and its different sides, that is a public sector organization (Oy Apotti Ab) as the platform provider, and public and private sector organizations as platform contributors and users.



3. How does this sound or how do you see this type of model? Do you see this type of model possible in Finland in the future? Why/ why not? What good/bad do you see in this model?

In order to function, and to create value, a platform naturally needs contributors, which is why it is important to understand the motivations for contribution of different actors.

PLATFORM PROVIDER (APOTTI)

4. What encourages you to provide/create a platform ecosystem?

5. How do you attract other actors to join the platform ecosystem? Why?

6. Why do you think that different actors want to join/contribute to the platform ecosystem?

7. How do you communicate about the benefits of the platform to potential contributors?

8. What do you think is the best way to attract other actors to join?

PLATFORM CONTRIBUTORS/USERS (HUS, MUNICIPALITIES, STARTUPS)

4. What would encourage you/your organization to join/contribute to a platform ecosystem? What would not? Why?

5. How should the platform ecosystem be designed so that you would like to join it? How it should not be designed?

6. In what ways in your opinion you or other startups could contribute to the platform ecosystem? What does this require?

APPENDIX 3: INTERVIEW DETAILS

Interviewee	Position	Code	Interview date	Interview length
1	CEO	Startup 1	14.12.2016	32 min
2	CEO	Startup 2	15.12.2016	42 min
3	Senior Adviser	Startup 3	15.12.2016	82 min
4	CEO	Startup 4	20.12.2016	68 min
5	CTO	Startup 5	29.12.2016	45 min
6	Program Manager	Public sector organization 1	20.12.2016	60 min
7	Division Director	Public sector organization 2	22.12.2016	61 min
8	Senior Executive	Platform provider 1	19.12.2016	31 min
9	Senior Executive	Platform provider 2	19.12.2016	57 min

APPENDIX 4: CODING SCHEMES

DIGITALIZATION OF PUBLIC SERVICES

Theme	2nd order coding	1st order coding	Representative quotes
Digitalization of public services	Early stage of digitalization	Lot of work to do More discussion than concrete actions and results Thus far focus has been on building the infrastructure for digitalization	*"I would say that the state of digitalization is in a very early stage in the public sector"* *"Well, at least there is a lot of discussion about digitalization. But it does not necessarily mean that something concrete could be seen, something real that would have been achieved. So in my opinion one could say that maybe there is more talking and declaration and such than concrete results."* *"There's really a lot of work"* *"For sure there is still a lot to do."* *"We are still in quite an early stage in digitalization, but I see that the national development is now moving forward in a good pace and building a good base on top of which it is good to build this digitalization."* *"We have many quite large programs ongoing of which some are creating these conditions for this [digitalization]"* *"In my opinion it's still this kind of beginning"*
	Reasons for early phase	Lack of collaboration	*"I think all hospital districts are working too much on their own, so there should be more collaboration...I think that if we are talking about public service development, it is pointless that hospitals are doing some in-house development...They should take companies with them to develop the services, since like that we would get some return for our tax money at some point...So somehow I would want to see more opportunities where startups are involved in development, and that their thoughts would be listened."* *"If we think about public healthcare, their task is not to develop new treatment mechanisms but its more the responsibility of the industry, and here we need this collaboration, and the collaboration is not possible if there is no external financing...or currently we don't have this type of model for financing public-private partnerships"*
		Bureaucracy, closed system	*It [public sector] is characterized by the fact that it is quite closed, inflexible and bureaucratic. So they probably would want to be more agile but somehow I feel that their hands are quite tied there. So that's why we don't - or there has been a lot of enthusiasm but often it falls down to the fact that there is legislation and regulations and there are closed systems to which you just can't [contribute]."* *"I hope it [digitalization] would come much faster that some organization or even the government or*

			the hospitals themselves would have some open parts for startups or like incubators or stuff like that so that they themselves can understand more about the digital world."
		Negative atmosphere	*"I think that the worst case scenario would be if governmental agencies tried to control the market in a dictating and directing way rather than an enabling way."* *"Usually in this kind of development work when we are talking about large entities, there are more people who say why this cannot be done than people who would think that how this should be in 20 years when it should be working. When we build to the future, we talk about today's technical issues or legislative challenges, so only very few people look into the future in my opinion."* *"There is this lack of faith and courage. People are afraid of failure...and with this kind of attitude nothing moves forward."* *"In the public sector there is no such compulsion [to succeed], the government always comes and helps...and this then again leads to the fact that there is no risk-taking ability to do experiments...and if we now talk about innovation, I don't see any innovation in that, or if there is no possibility to fail, it is clear that innovations won't be created either."* *"The healthcare sector could be more open for example to measure health care data and encourage preventive solutions...it's like there is resistance in the market"*
		Lack of common vision and leadership	*"Everyone understands it [digitalization] through their own experience and industry …so you need to talk for quite a long time before everyone has the same direction."* *"How you get everyone to talk about the same thing and focus on the essentials...that's challenging"* *"Some kind of leadership is missing...that someone would come and say that this is how we do it now, end of discussion. Here is some money for you, this is how we do it now. That is missing. There is no overall view."* *"There is no common vision"* *"Different people have different views on digitalization"*

GOVERNMENT-AS-A-PLATFORM

Theme	Representative quotes
Support for government-as-a-platform	*"I would want to see this [as possible]...or I see that services should be available and the data that we are now collecting makes it possible that services can be customized and the needs of people can be understood and the processes can be automated."* *"For sure we are going to this direction. The reason for that is that the public sector actors currently cannot provide, or don't have the resources to provide, services on their own. And then on the other hand there is also clearly a political tendency to open up the society."* *"I think it's kind of the way it should be."* *"I am an optimist to that extent that of course it should be like that, or that there should be a vision that government-as-a-platform can exist. And we should be going to that direction. Then we should just think about what are the barriers that need to be removed in order for this to happen."* *"I think this is realistic, this [government-as-a-platform] will happen in any case, we cannot prevent that. So even if we did everything as foolishly as possible, still in the worst case we can only postpone its realization with ten years...So as a development path this is unavoidable."* *"We are going towards this, it happens no matter what."* *"Now that there is an agreement on freedom of choice in social care and healthcare, that requires something like this...like a service platform or platter from which the person can select...Somehow this needs to be solved and figured out."* *"One thing that is correct in this [government-as-a-platform] is that the citizen is in the center...or everything is going towards the idea of citizen-centricity...the citizen has to be in the center of everything"* *"I think it's definitely a good vision and how it should be."* *"This is possible, since everything is possible if you just want to do certain things."* *"What I think is interesting about this [government-as-a-platform] is that if the government understood that they actually are this type of bigger entity through which different commercial actors get in...so if they would advance this kind of thinking"*
Challenges of government-as-a-platform	*"I think that in order for this [government-as-a-platform] to work efficiently, the public sector needs to reduce control and drive privatization even more and in a way make it possible for private service providers to be public service providers...Or I believe that in order for the public sector money to suffice, we need to get more private organizations to provide services on the public side...or clearly more power needs to be given to the private sector and maybe yes regulate the services but you need to think how this service could be more flexible and how services could be combined and innovated "* *"Then if it is open so that I as a consumer and citizen can truly select the most optimal service for me, then I see this as a good thing. But if it goes so that we have these [options], but then there are three from which you can select, one provided by X, one provided by the government, and one provided by Y, then in my opinion it is not really the kind of freedom of choice that is in the citizen's control."* *"What I'm maybe questioning is whether we have a sufficient mass for this in Finland...Or I'm not questioning whether there would be a demand and need for this, but rather whether we can provide something like this efficiently in Finland."* *"A challenge can be that these ecosystems [industries within the public sector] are in different development phases and common models aren't found after all"* *"The balance between a centralized administrative structure and an infrastructure enabling innovation, there are a lot of risks there"*

	"In the public sector there is sometimes this jealousy that you are only fixing your own problems so I think that this is one of the biggest threats for this [government-as-a-platform] that the [industry] ecosystems don't cooperate" *"Too many abstract layers should not be constructed, but make the practical operations simpler and more harmonized...or what determines if different actors want to join the cooperation is whether it is easy, useful and fast"*
Support for platform ecosystem thinking in the public sector	*"I think it [ecosystem] is a good thing...since we know we have some functionalities for which there are no solutions yet or where development is needed, that is where we need startups."* *"We need to go towards that [ecosystem], since otherwise the entire system will die over time since it cannot innovate or develop on its own. Or it is a trend everywhere right now that you seek for that speed from the outside, and to stay up-to-date you need to collaborate with startups and small companies who can then move faster."* *"The platform is like a horizontal system that connects different actors and services and provides a single view for the citizen...that is good!"*

FACTORS ENCOURAGING PLATFORM ECOSYSTEM CREATION

Theme	**1st order coding**	**Representative quotes**
Operational efficiency	Improved service offering	*"We are building an ecosystem to have the most comprehensive set of services in the use of patients and industry professionals as possible... and to get the best possible service offering for both patients and industry professionals, it is smart to invite these actors, who have developed different applications and services, to join this cooperation through the ecosystem"* *"Our task is to create functioning tools for the public sector actors that are flexible, reliable, and above all, easy to use* *"We provide products and platforms that are as refined as possible for this"*
Social contribution	Providing growth opportunities for startups	*"This is a chance for Finnish health tech startups to get access to rather big clients and commercial opportunities, and through that there are also important societal benefits, since if the startups perform well, get a chance to grow and get new clients, that way we of course get more tax money to the society and like that general wellbeing improves."* "*If a Finnish company gets a lot of money from abroad, hopefully they pay their taxes to Finland and then we save lives again with that money."*
	Providing an opportunity for public sector organizations to collaborate with startups	*"We want to create this kind of market for public sector organizations where they can leverage the innovativeness, agility and ability to go to niche markets"* *"There are these niche functionalities that we want, and we see that the smartest and most agile way to get them is to have these small and medium-sized companies...or that we give them a chance to bring their own products and services to complement our offering...So we want to benefit from that knowledge and drive."*
Learning	Learning and getting to know startups	*"...learn what the startups do and what their people know...and getting to know the people as well"*

Market trends	Market pressure Public discussion	*"Our experience along the years seems to signal that there is a lot of pressure for this [ecosystem], public discussion indicates that there is interest and need for this, and also some preliminary analyses that we made for a wide group of different parties, all of these seem to strengthen the same image...Or at least different parties have a similar view of it. Of course people have a bit different expectations of what the operating models are, but an ecosystem as a broader concept seems to be self-explanatory."*

FACTORS USED FOR ENCOURAGING PLATFORM CONTRIBUTION

Theme	**1st order coding**	**Representative quotes**
Flexibility and openness	Listening to startups' ideas and opinions	*"Figuring out this [why different actors want to join] is part of building the ecosystem"* *"We have this rapid initiation approach, which means that we begin [the work] and start asking what kind of information is wanted, and what is important, and then start to provide that [information] accordingly. And it should be noted that the platform is a constantly evolving thing, so the more time passes, the more there is something ready and the more we can open it up."* *"We are iteratively increasing communication, so we have started from the fact that since our world is not ready, instead of sort of burying the final message in a chamber, we have taken an approach that hey, we want to do something like this, but we don't know how it will take shape, we could iterate with you [startups]...tell us what you need. So already now there is a chance to influence how this ecosystem will become."*
	Communication through different channels and events	*"Public website, then we have sent e-mail and are quite active in social media"* *"A site exists where you get access to the interface descriptions"* *"Obviously we are using different channels, we have communicated in our own channels about this and directly with identified organizations and industry players...and have tried to sort of create a network around this."*
Concreteness	Focus on action through fast experiments, rather than networking and discussions	*"It is important to react fast and use fast experiments to get access to this great group of startups that we have in this area in Finland"* *"We try their services, which means that a short experiment with little money starts immediately"* *"Startups are presumably interested in action instead of talking about action"* *"Concrete benefits through action"* *"Functionality, daring to try, making experiments, this type of thinking that is part of everyday life in the startup world"* *"We aim to go to the same direction and with the same logic that startups are using...We need to show, or it needs to look interesting for the actors that we want to join."*
Business opportunities	Market access Access to information	*"Providing access to broader, more profitable and better business for startups"* *"Commercial benefits, guidelines, access to interfaces"*

	Access to industry experts Coaching Financing/sponsoring	*"When we have this type of platform in which a core component is Epic, which is one of the most used patient information systems in the world, this becomes a natural market access platform"* *"Simple market access, we make it possible for these health tech startups"* *"Market access is one thing, and another one is access to industry logic. Or there is this interesting thing that if you don't know how for example the operating room works, you cannot really read that from a book...so that you get to discuss with industry experts or listen to their unfulfilled needs is one example of what we aim to build...so at its best we would create this kind of business incubator type of concept for idea development"* *"You have market access, then you have information sharing and then some of these would of course want to have some financing"* *"Financing is tricky for us since there are so many of these companies so we cannot really act as a business angel"* *"We have tried to do this type of cash injection -models which support their operation during the ideation stage"*
Social capital	Contacts, networks, partners, peer support	*"One reason why there are so many of these ecosystems and business incubators is that the companies get this kind of place where they can seek for contacts, partners, ideas and peer support."*

FACTORS ENCOURAGING PLATFORM CONTRIBUTION OF STARTUPS

Theme	**1st order coding**	**Representative quotes**
Convenience	Ease of use, simplicity, convenience	*"It [integration] should be as easy as possible"* *"It should be easy"* *"More flexibility"* *"Technology should not be a barrier...it should be an enabler."* *"Easy access"* *"I think it is important that the platform provides some kind of API or some kind of interface which is very easy and simple to understand without any troubles...And even better if the system also provides some kind of toolbox...that makes it even more convenient."* *"I think that the supporting tools will help many startups and even big companies to join because it will lower the threshold."* *"Easy and fast enough"* *"Openness and using common industry standards, not like healthcare industry standards, they have their own, but these that are used in the web, since they are the easiest ones to use. Or they [healthcare industry] usually have their own ways which are not that common and thus it's more difficult to integrate."* *"That you can integrate to it, or the ease, technical ease like I said is one thing"*
	Lack of bureaucracy, short, fast, agile, and uncomplicated processes	*"Public decision-making is too bureaucratic and hierarchical...processes are really long"* *"Reducing bureaucracy"* *"Little bureaucracy"* *"If there is an opportunity somewhere else to move forward faster, it is much more interesting than if for example decision-making is too slow here...or the feeling that things proceed creates some kind of meaning to it, that this is actually wanted."*

		"Agility is maybe the right word, so if it is a project that lasts six months or a year, we aren't that interested. Or then the business value needs to be so good that it interests us. So it's kind of like this ease and lack of bureaucracy. Of course when we talk about healthcare there is always some [bureaucracy], but it should be reduced to a level that it would be sort of encouraging to start investigating it [the platform] and using time to integrate to it." *"It should be more about getting things done and action"* *"Ease in terms of processes...so that there is as little as possible of this kind of process hassle like all kinds of agreements and papers and audits and all such things."* *"Due to the nature of startups, you always need to think about the most efficient way to do things."*
	Decreased ambiguity and risks	*"There should not be too many risks for us...or we are all the time making decisions about the direction we should go to...since it's a fact that a startup stays alive as long as we can move forward"*
	Fast experiments	*"Having this kind of sandbox where you can test and experiment how it goes"* *"Possibilities to experiment and fail"* *"Getting a chance to make experiments and fail"* *"Of course this type of experiments are good...I think it's a good model"* *"Experiments are good...if you have these that you test for a short while how things go with a small group, those are for sure easy for both sides when the platform provider doesn't need to commit that much and at the same time startups don't need to commit and then you can start developing further from there."*
Transparency	Communication	*"Communication should be extremely good and as transparent as possible."* *"Communication is very important. Usually it goes so that there is a lot of talking and the concepts remain unclear and they are misunderstood and therefore things cannot proceed and the vision is not presented so its really hard to pull the rope to one direction when everyone is kind of going into a different direction and driving their own agenda."*
	Openness	*"I think it's good that startups are included in the actual platform development early enough. It's more transparent, and not just like that here are the interfaces, figure out how they work and maybe at some point they will be opened up, but rather that it is communicated that the platform wants to learn from startups how they could benefit from them and what kind of services they could offer."* *"Openness and transparency are really important."* *"Openness, yes...definitely that's one thing that is fundamental"*
	Trustworthiness and robustness	*"How trustworthy the data is and who is going to authorize this data...like who is going to watch all these apps like how reliable they are...one is quality and one is the robustness like how stable the services are...who is going to control and guarantee the quality of the data"*
Information	Documentation	*"As good descriptions as possible about the system and what is needed"*

		"Interfaces and interface descriptions are enough and then a sandbox so that you can go and try it out." *"Documentation is always critical, but if REST interfaces are used, it doesn't require any toolkits or special development environments in my opinion."*
	Clear "rules of the game"	*"There are these questions that what if there is another company involved...will they get some kind of advantage...so having clear 'rules of the game' for everyone related to these kinds of issues"*
	Clear earnings logic	*"Organizations are always making business, so what kind of model there is or if you join, how you make business out of it"* *"If there are these actors who get the information we for example provide to the platform, so how does that benefit us financially"* *"For us startups the biggest question often is that where does the money come from and how fast."* *"There need to be clear rules and an agreement on the earnings logic to reduce the risk that someone else collects the benefits when we open up our solution and data."*
	Access to data	*"This open data which is an opportunity for innovations, we also need some rules for that how it could be made open and like that make experiments and pilots"* *"There should be a possibility for companies to access it [data], if they have an idea for which they want to use it."* *"I hope there is an easy way for startups and other companies to get access to some parts of the personal data under some kind of agreement...because it is not possible for one company to collect all this data [on its own]."*
	Access to industry experts	*"Of course some kind of possibility to contact clinical experts is required [to be able to contribute to the platform], or that there would be for example a person from whom you could reserve half an hour and discuss...So somehow I would think that how experts could be involved, and how it would be made as easy as possible for companies to get some sparring from these experts."* *"That these people [healthcare professionals] are also part of this platform and can communicate their clinical understanding and their view"* *"Getting a chance to discuss with industry experts...it's crucial to understand the industry logic"*
Financing	Getting financing or sponsoring	*"There should be some financing mechanisms that support [innovation]"* *"These financing mechanisms that we have should be developed"* *"It [joining] needs to be financially possible"* *"We will not join if we need to pay everything by ourselves."* *"Financing is actually quite essential, because something that big players often forget is that for them the sums are insignificant, but for startups they are big sums. This should always be kept in mind when working with startups."*
Business opportunities	Growth opportunities	*"The system provider [Epic] is a new actor in Finland and globally it is really big, so when startups get to work with them in Finland, it is so much easier to take one's product or service abroad when we can say that we know the system and have made integrations to it."*

		"We see that there is potential [with the platform] to take a step further and make our service more meaningful and like this solve even deeper problems" *"international opportunities...the platform provides an excellent path to international markets"*
	Financial benefits	*"If I'm completely honest, all motivations are financial in one way or another...in my opinion an entrepreneur who says that the financial side is not that important is lying."* "The question is always what is the investment...what we can get out of it" *"If our solution was freely integrated to the system, then we would also want to have free access to other services in the system."* *"If the platform wants startups to join, it facilitates [startups'] decision-making a lot if they are ready to sponsor the work."* *"Financing is actually quite essential, because something that big players often forget is that for them the sums are insignificant, but for startups they are big sums. This should always be kept in mind when working with startups."*
Reputation and credibility	References	*"If we can say that we work with HUS and others in Finland, of course it is valuable"* *"HUS is a big and important player, and therefore an extremely good reference when going abroad."*
	Validation, credibility	*"To some extent also credibility in the eyes of the industry players would probably be a big benefit for us in something like this"* *"It [taking part in a large public sector project] is just this type of credibility and validation for our operations."*
	Publicity, recognition	*"The publicity you can leverage to get some international growth is something we'd be interested in"* *"Publicity and also recognition"* *"Recognition"*
	Ability to demonstrate viability of solution	*"It is an opportunity to demonstrate the viability of our solution. And that is important for scaling our product or service and to get more financing."* *"Credibility and being able to provide clinical evidence is especially important in the healthcare industry... it would be good if there would be some kind of opportunity for startups to do so in the platform"*
Learning and reciprocity	Learning	*"It's always so that when we collaborate, everyone is learning."*
	Others' examples	*"Others' examples, so if someone sees that those did something and it's possible so if you give examples that this is how you should do it or not all learning starts from the very beginning so it could be communicated and like that encourage participation"*
	Knowledge sharing, collaboration	*"One thing that could be good in this kind of platform is somehow sharing this intellectual capital so that everyone wouldn't need to start from the very beginning...that this knowledge and expertise could be shared."* *"Telling examples, telling success stories and also why someone did not succeed"*

		"If this platform could also become a hub where multiple people from different backgrounds could join and contribute in different ways, that would be something...or that people would have more chances to educate each other and interact with each other...and also it would be like this brainstorm with different opinions, ideas and opportunities from multiple parties." *"Between the startups it's also the thing that there is probably a lot of potential form many startups to cooperate"* *"Also it's like a brainstorm, like different opinions and ideas from multiple parties"* *"It would probably be good to have some discussion forum since startups have for sure this kind of novel ideas and a lot of views on how things can be done...and then the platform provider also must have a lot to give for the startups as well, what they should for example think about for example in terms of information security or such...so something where you could discuss together"*
	Contacts, networks, community	*"It [the platform ecosystem] enables a sense of community for entrepreneurs, since entrepreneurs are anyway quite lonely people, so when you find friends with whom you can do some sparring it's good."* *"You need those networks to get resources"*
Social contribution	Doing good	*"I've said that I could give our solution for free since we get positive recognition when we do something for the common good"* *"Our motivation is that we really get to do something good. Or that what we make is useful and meaningful is a source of motivation."* *"The basic idea for our startup is that we want to do good and change the current situation."* *"Of course there are these kind of soft values as well, or that we would want that this type of information would be available to doctors...so if we forget about the commercial aspects, this is really an interesting area where we would be happy to be involved."* *"Of course when we are on the healthcare sector, you somehow get this good feeling when you can help people and bring them a better life."*

FACTORS ENCOURAGING PLATFORM PARTICIPATION OF PUBLIC SECTOR ORGANIZATIONS

Theme	1st order coding	Representative quotes
Operational efficiencies	Harmonized, integrated systems and processes	*"There are lot of systems"* *"Current regional social care and health care is extremely fragmented, each municipality has its own systems, processes and cultures"* *"With this we can harmonize the culture, and for example increase mobility of the professionals in this area"* *"Harmonized systems, harmonized processes"*
	New and modern solutions	*"Our systems are old"* *"Even if they were functioning systems, they are quite old"*
	Cost savings	*"Separate systems are extremely costly to maintain"* *"Operational change and increased impact and through that increased productivity"* *"The bigger the area in which we operate, the more efficient operations"*
Convenience	Flexible and agile ways to get new functionalities	*"The ecosystem brings a more agile way to get new functionalities, instead of always making changes to the core...it also gives some flexibility"*
	Offering that matches individual organizations' needs	*"HUS has its own needs or we are not doing demanding neurosurgical operations and such in municipalities"* *"The size of the municipalities varies, and thus also their needs"* *"HUS differs from the municipalities since they are focusing on specialized care and thus they have clearly different focus areas"*
	Centralized organization acting as platform coordinator	*"It is quite easy for the municipalities to participate as there is a centralized organization that is agile and dynamic, who drives the process forward"* *"We are happy about the fact that there is only one actor with whom we need to interact, instead of many"*
Openness	Collaboration of different actors	*"We were thinking that is it smart or not that we do on our own"* *"This needs to be built together for a larger area for sure"*
	Open interfaces	*"Interfaces need to be open when new systems are procured"*
	Avoiding vendor traps	*"Systems need to be such that one vendor monoliths cannot be formed"* *"Maintaining current systems is a vendor trap at the moment, or there are these monopoly vendors who are quite controlling"*
Learning and reciprocity	Learning and knowledge sharing	*"Collaboration with a world class software vendor is something we most definitely will benefit from, and they probably also learn from us"*